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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 17, 1985 Volume 1061 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 14, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,363,140 through 4,364,122
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patent listed below has expired due to failure to pay the required maintenance fee and any applicable surcharge.

Patent Which Expired Sept. 29, 1985, Due to Failure to Pay Maintenance Fee

Patent Number	Serial Number	Issue Date
4,291,808	06/215,853	9/29/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,410,438, Re. S.N. 792,351, Filed Oct. 29, 1985, Cl. 252/49.6, BORATED EPOXIDES AND LUBRICANTS CONTAINING SAME, Andrew G. Horodysky, Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, et al., Ex. Gp.: 118

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 30,333, Reexam. No. 90/000,897, Requested: Nov. 1, 1985, Cl. 60/605, EBULLIENT COOLED TURBOCHARGER BEARING HOUSING, Philip B. Gordon, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Wegner, Stellman, et al., Ex. Gp.: 340, Requester: Morgan, Finnegan, et al., New York, N.Y.

3,957,084, Reexam. No. 90/000,900, Filed Nov. 6, 1985, Requested: 138/122, DEVICE FOR CARRYING FLEXIBLE CABLES OR PIPES FROM A FIXED CONNECTION POINT TO A MOBILE CONSUMER BY MEANS OF A FLEXIBLE TUBE, Werner Jung, Owner of Record: *Katrapat AG, Zug, Switzerland,* Attorney or Agent: Cyril Hajewski, Ex. Gp.: 240, Requester: Advanced Machine & Engineering Co., Rockford, Ill.

4,066,274, Reexam. No. 90/000,903, Requested: Nov. 12, 1985, Cl. 280/411, TANDEM FOLDING IMPLEMENT, Raymond A. Adee, Owner of Record: *Hesston Corp., Hesston, Kans.,* Attorney or Agent: Stephen D. Timmons, Ex. Gp.: 330, Requester: Owner

4,194,582, Reexam. No. 90/000,890, Requested: Oct. 23, 1985, Cl. 175/321, DOUBLE ACTING SHOCK ABSORBER FOR DRILL STRINGS, Alfred Ostertag, Owner of Record: *Christensen, Inc., Salt Lake City, Utah,* Attorney or Agent: Mario A. Martella, Ex. Gp.: 350, Requester: Smith International, Inc., Newport Beach, Calif.

4,236,585, Reexam. No. 90/000,902, Requested: Nov. 12, 1985, Cl. 172/587, FOLD-BACK IMPLEMENT FRAME HAVING ANGLE ADJUSTMENT, Raymond A. Adee, et al., Owner of Record: *Hesston Corp., Hesston, Kans.,* Attorney or Agent: Stephen D. Timmons, Ex. Gp.: 330, Requester: Owner

4,367,310, Reexam. No. 90/000,901, Requested: Nov. 8, 1985, Cl. 525/67, BLENDS OF POLYCARBONATE WITH RUBBER AND MONOVINYLIDENE AROMATIC COPOLYMERS, David E. Henton, Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, Ex. Gp.: 150, Requester: Owner

4,405,641, Reexam. No. 90/000,899, Requested: Nov. 4, 1985, Cl. 514/785, CONSISTENCY REGULATOR FOR COSMETIC AND PHARMACEUTICAL PREPARATIONS, Karl Seibert, Owner of Record: *Akzona, Inc., Ashville, N.C.,* Attorney or Agent: Louis A. Morris, Ex. Gp.: 120, Requester: Owner

Change to the Processing Period for Trademark Registrations Issued

The processing period between publication for opposition and registration will be changed from 10 weeks to 12 weeks beginning with applications published for opposition on Oct. 15, 1985. Therefore, from Oct. 15, 1985 onward, trademark applicants can expect to receive a registration 12 weeks after the mark is published for opposition so long as an opposition or request for extension of time to oppose is not filed against their application.

As a result of the change from a 10-week to a 12-week processing period, few if any registrations will issue in the Dec. 24, 1985 and Dec. 31, 1985 Trademark Official Gazettes.

Oct. 29, 1985.

MARGARET M. LAURENCE,
Assistant Commissioner, for Trademarks.

Erratum

The notice of adverse decision in interference, appearing in the *Official Gazette* of Nov. 15, 1983, to wit:

> In Interference No. 100,963, involving Patent No. 4,207,876, L. D. Annis, COMPRESSION DEVICE WITH VENTILATED SLEEVE, final judgment adverse to the patentee, was rendered Sept. 23, 1983, as to claims 1-6.

is rescinded. The adverse award of priority with respect to Annis was vacated by the Board of Patent Interference and the interference was subsequently dissolved. Consequently claims 1 to 6 of the Annis patent are not cancelled.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1985 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with T through Z. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with T through Z and you have not received a data sheet or if you returned the data sheet to OED and you did not receive and acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557-1728.

Nov. 20, 1985.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

C. W. Butler, d/b/a Butler Farms, Weslaco, Tex., Reg. No. 823,716, for the mark "TURTLE", Canc. No. 14,623.

Huggers Manufacturing, Inc., Baytown, Tex., Reg. No. 1,164,680, for the mark "HUGGERS, HUGGS 'EM HOT OR COLD" and design, Canc. No. 14,652.

DiMare Bros., Inc., assignee, by mesne assignment, of Mitchell J. Slayman, d/b/a Slayman Fruit Co., Lindsay, Calif., Reg. No. 1,037,617, for the mark "PAN-AMERICAN", Canc. No. 14,889.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

New Plant Patent Grant Covers

New covers will be used on plant patents issued on or after Jan. 7, 1986.

The new covers are of the same design as the covers currently in use on other patent grant documents.

Nov. 22, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner,
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 17, 1985

PP. 5,473	4,494,127	4,526,295	4,539,827
D. 279,476	4,496,730	4,526,583	4,539,998
D. 280,621	4,499,557	4,526,838	4,540,327
D. 280,722	4,499,755	4,527,255	4,540,595
3,905,839	4,500,160	4,527,869	4,540,699
4,352,884	4,502,861	4,528,983	4,540,929
4,400,490	4,503,148	4,529,445	4,541,095
4,400,800	4,504,977	4,529,454	4,541,273
4,421,243	4,508,620	4,529,580	4,541,438
4,424,399	4,510,323	4,529,729	4,541,461
4,426,806	4,514,500	4,529,813	4,541,501
4,437,118	4,515,563	4,530,792	4,542,026
4,446,158	4,516,208	4,530,963	4,542,089
4,447,048	4,516,478	4,531,691	4,542,095
4,450,440	4,517,004	4,531,974	4,542,299
4,463,995	4,518,458	4,532,353	4,542,968
4,464,764	4,520,287	4,532,436	4,543,088
4,467,618	4,520,461	4,532,449	4,543,575
4,471,054	4,521,519	4,532,914	4,543,888
4,473,078	4,522,012	4,533,295	4,544,348
4,473,152	4,522,573	4,533,654	4,544,371
4,475,104	4,522,656	4,534,454	4,544,531
4,481,339	4,522,787	4,534,756	4,544,680
4,481,447	4,522,892	4,535,099	4,544,810
4,481,944	4,522,951	4,535,460	4,545,764
4,481,950	4,523,368	4,536,145	4,545,826
4,482,040	4,523,721	4,536,248	4,546,013
4,482,314	4,524,050	4,536,723	4,546,367
4,482,716	4,524,377	4,536,836	4,546,453
4,482,893	4,524,584	4,536,989	4,546,597
4,486,697	4,524,828	4,537,949	4,546,830
4,487,517	4,524,941	4,539,006	4,547,859
4,490,454	4,525,360	4,539,105	4,548,957
4,490,514	4,525,605	4,539,484	4,550,179
4,493,298	4,525,997	4,539,807	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 9, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-14-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,408,657 to 3,413,655, inclusive

Plant Patents ..... Numbers 2,844 to 2,846 inclusive

REEXAMINATIONS

DECEMBER 17, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Des. 267,873 (434th)
BASE FOR A TELEPHONE SET

Wilbert C. Brown, Fairfield, and Philip B. Saba, Trumbull, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Reexamination Request No. 90/000,637, Sep. 24, 1984.
Reexamination Certificate for Patent No. Des. 267,873, issued Feb. 8, 1983, Ser. No. 88,980, Oct. 29, 1979.
U.S. Cl. D14—60

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

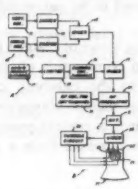
The patentability of the claim is confirmed.

The ornamental design for a base for a telephone set, substantially as shown and described.

B1 3,900,886 (435th)
SONIC COLOR SYSTEM

Jan R. Coyle, 514 E. Ghent Ave., and Robert W. Stevens, 1727 Via Alegre, both of, San Dimas, Calif. 91773

Reexamination Request No. 90/000,779, May 13, 1985.
Reexamination Certificate for Patent No. 3,900,886, issued Aug. 19, 1975, Ser. No. 827,248, May 23, 1969.
Int. Cl.[4] H04N *9/02*
U.S. Cl. 358—82



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

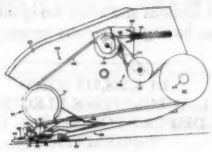
The patentability of claims 1–8 is confirmed.

1. In a sonic color system, the combination of color receiver means having a luminescent screen, electron guns for exciting said screen to produce color patterns on said screen, video circuit means and chroma circuit means connected to the cathodes and grids of said electron guns, antenna means for picking up signals and connected to said circuit means to control said electron guns, and sonic signal responsive means connected to said antenna means and including a chroma oscillator and a RF oscillator, one of said oscillators being variable to produce a variable phase signal depending on the sonic signal for controlling said circuit means to produce color patterns on said screen.

B1 3,982,383 (436th)
HARVESTING PLATFORM WITH A FLOATING CUTTER BAR

Roger E. Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Reexamination Request No. 90/000,715, Jan. 25, 1985.
Reexamination Certificate for Patent No. 3,982,383, issued Sep. 28, 1976, Ser. No. 523,509, Nov. 13, 1974.
Int. Cl.[4] A01D *69/08*
U.S. Cl. 56—11.6



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. A harvesting platform for a mobile harvesting machine comprising a transversely elongated platform frame having opposite sides; a platform floor extending between the opposite sides; a transverse flexible cutter bar assembly including a reciprocatable sickle, extending between the opposite sides forwardly of the floor and operative to flex vertically to a limited degree to follow the contour of the ground; means mounting the cutter bar assembly on the platform frame for vertical adjustment relative thereto so that the cutter bar assembly follows the contour of the ground; a drive mechanism having a rotary input element and a reciprocating output element drivingly connected to the sickle, the drive mechanism being mounted on one end of the cutter bar assembly for vertical adjustment therewith, and a belt drive means mounted on one side of the platform frame on the same side of the platform as the drive mechanism and operatively connected thereto, said belt drive means including belt tensioning means operative to provide belt tension regardless of the vertically adjusted position of the drive mechanism relative to the platform frame.

B1 4,064,744 (437th)
STRAIN SENSOREXTENSIOMETER

Walter P. Kistler, Redmond, Wash., assignor to Kistler-Morse Corporation, Bellevue, Wash.

Reexamination Request No. 90/000,653, Oct. 18, 1984.
Reexamination Certificate for Patent No. 4,064,744, issued Dec. 27, 1977, Ser. No. 692,977, Jun. 4, 1976.
Int. Cl.[4] G01B *7/16*; G01L *1/22*
U.S. Cl. 73—766

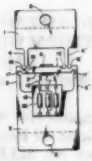
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 and 11 is confirmed.

Claim 10 is cancelled.

1. A strain measuring instrument with electrical output, comprising two end sections through which the instrument can

be attached to a structure and a mid-section including a beam arranged substantially perpendicular to the instrument axis and mechanically connected to the end sections through two pairs



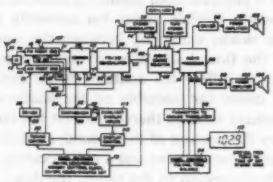
of symmetrically arranged but unequally spaced flexible bridges and carrying at least two strain responsive resistive elements, said end sections and beam being integrally formed by a solid metal bar having a generally rectangular cross section.

B1 4,268,915 (438th)

UNIVERSAL AUTOMOTIVE ELECTRONIC RADIO WITH DISPLAY FOR TUNING OR TIME INFORMATION

Bernard S. Parmet, Park Ridge, Ill., and John Marley, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Reexamination Request No. 90/000,708, Jan. 9, 1985.
Reexamination Certificate for Patent No. 4,268,915, issued May 19, 1981, Ser. No. 77,201, Sep. 20, 1979.
Continuation of Ser. No. 789,597, Apr. 21, 1977, abandoned, which is a division of Ser. No. 583,343, Jun. 2, 1975, Pat. No. 4,135,158.
Int. Cl.[4] H04B *1/16*
U.S. Cl. 455—158



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 4–6, 12 and 14 are determined to be patentable as amended.

Claims **3, 7–11, 13 and 15–17**, dependent on an amended claim, are determined to be patentable.

New claims **18–23** are added and determined to be patentable.

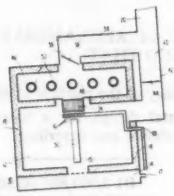
1. A radio/clock combination comprising:
a radio which produces an output signal representative of the frequency to which the radio is tuned, and
a clock which produces an output signal representative of the time of day,
wherein the improvement comprises:
control means selecting either the radio output or clock output signal including means for predeterminedly scaling and processing the selected signal to activate selected readout drivers,
readout devices coupled to corresponding drivers which, when activated, produce a desired display,
oscillator means producing an output signal of predetermined frequency,
means processing the oscillator means output signal to tune the radio to a desired frequency the desired frequency being a function of the predetermined frequency of said oscillator means output signal, and
means processing the oscillator means output signal to active the clock,
whereby the readout selectively displays either the frequency to which the radio is tuned or the time of day.

B1 4,330,503 (439th)

WOOD BURNING STOVE

Roger A. Allaire, Big Flats; William F. Pardue, Jr., and Robert V. VanDewoestine, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Reexamination Request No. 90/000,509, Feb. 27, 1984.
Reexamination Certificate for Patent No. 4,330,503, issued May 18, 1982, Ser. No. 173,157, Jul. 28, 1980.
Int. Cl.[4] F01N *3/10*
U.S. Cl. 422—177



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **7** is confirmed.

Claims **1–6** are cancelled.

Claim **8** is determined to be patentable as amended.

7. The wood burning stove of claim **1** including exhaust flow director means in said combustion chamber for directing said combustion exhaust to the catalytic converter means, said exhaust flow director means comprising a vane extending perpendicularly towards a central portion of an inlet face of said catalytic converter means from a point above and near said grate.

B1 4,403,653 (440th)

HEAT TRANSFER ELEMENTS

Maxwell W. Davidson, Edinburgh, Scotland, assignor to United Wire Group PLC, Granton, England

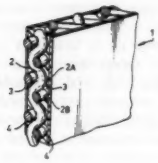
Reexamination Request No. 90/000,621, Sep. 19, 1984.
Reexamination Certificate for Patent No. 4,403,653, issued Sep. 13, 1983, Ser. No. 143,840, Apr. 23, 1980.
Continuation-in-part of Ser. No. 933,130, Aug. 9, 1978, abandoned.
Claims priority, application United Kingdom, Aug. 11, 1977, 33662/77
Int. Cl.[4] F28F *3/04, 21/06*
U.S. Cl. 165—170

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–10** are cancelled.

New claims **11–19** are added and determined to be patentable.

11. Heat exchange apparatus including heat exchange wall means separating hot and cold ducting serving respectively for the passage of relatively hot and cold fluids whereby heat can be transferred between the relatively hot and cold fluids in the ductings via said heat exchange wall means; said heat exchange wall means comprising a composite wall member made from first and second wall portions of different thermal conductivity, said first wall portion being of higher thermal conductivity and comprising a close metal mesh extending longitudinally to the fluid flow with weft and warp strands woven together to define a nodal network and serving for transfer of the bulk of the heat across the heat exchange wall, said second wall portion comprising a filler layer



serving to close the spaces in the mesh and having outer surfaces, said filler layer being made wholly of plastics material and having a lower thermal conductivity than said metal mesh, and at least one additional coating layer applied to at least one outer surface of the filler layer to ensure that the mesh is covered, said additional coating layer being porous to deter build up of fouling films on at least one outer surface of the heat exchange wall by fluids flowing in the ductings, said second wall portion extending in the longitudinal direction of the metal mesh, with outer surfaces parallel to the mesh, nodes of the network being located adjacent the outer surfaces of the second wall portion so as to be sufficiently close to said relatively hot and cold fluid to permit a substantial transfer of heat by the mesh from one of said outer surfaces of the second wall portion transversely across the wall portion and perpendicular to the mesh to the outer surface of the second wall portion.

B1 4,420,568 (441st)

FLUORESCENT POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED TRIAZINYLAMINOFLUORESCEINS

Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Reexamination Request No. 90/000,617, Aug. 24, 1984.
Reexamination Certificate for Patent No. 4,420,568, issued Dec. 13, 1983, Ser. No. 325,872, Nov. 30, 1981.
Continuation-in-part of Ser. No. 173,553, Jul. 30, 1980, abandoned.
Int. Cl.⁴ G01N *33/536*; C07D *311/82*
U.S. Cl. 436—536

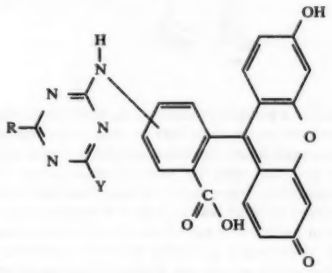
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **3** and **6–34** is confirmed.

Claim **4** is cancelled.

Claims **1** and **5** are determined to be patentable as amended.

1. A method for determining ligands in a sample comprising intermixing with said sample a biologically acceptable salt of a tracer of the formula:



wherein

Y is halo or lower alkyl; and

R is a ligand-analog *having a molecular weight within the range of 50 to 4000* wherein said ligand-analog has at least one common epitope with said ligand so as to be specifically recognizable by a common antibody;

and an antibody capable of specifically recognizing said ligand and said tracer; and then determining the amount of tracer bound to antibody by fluorescence polarization techniques as a measure of the amount of ligand in the sample.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,047

PROCESS FOR THE PRODUCTION OF A CRIMPED CONTINUOUS MULTIFILAMENT YARN

Eberhard Krenzer, Ennepetal-Rüggeberg, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Original No. 4,338,776, dated Jul. 13, 1982, Ser. No. 958,644, Nov. 8, 1978. Application for reissue Jul. 10, 1984, Ser. No. 629,268

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749867; Switzerland, Dec. 8, 1977, 014981/77

Int. Cl.[4] D02G *1/16, 1/20*

U.S. Cl. 57—246 **22 Claims**

1. A process for the production of a linearly stable, crimped continuous multifilament yarn which comprises:

guiding the initial non-crimped multifilament yarn between a first and second delivery system through an air-jet texturizing nozzle as a texturizing zone at *a temperature insufficient to heat set the yarn and at* an overfeed rate corresponding to a circumferential speed V_2 of the second delivery system which is less than the circumferential speed V_1 of the first delivery system, thereby forming multiple random loops in the individual filaments including a minor proportion of metastable loops;

eliminating or at least pulling out to a stable position a predominant number of said metastable loops without removing the other random loops and without any elastic or plastic deformation of the individual filaments by conducting the yarn immediately after it has left the texturizing zone into a heat-free stabilizing zone by means of a third delivery system having a run-out speed V_3 greater than the run-in speed V_2 of the second delivery system[, such that metastable loops are pulled out of the yarn without causing any elastic or plastic deformation of the individual filaments];

then conducting the stabilized yarn into a setting zone by means of a fourth delivery system having a run-out circumferential speed V_4 which allows a *controlled* shrinkage of the yarn to a predetermined amount, the yarn in said setting zone being subjected to a shrinking treatment and heat treatment at temperatures from 150° C. up to about 245° C.; and

winding the yarn after said shrinkage onto a spool at a predetermined yarn tension and at a winding speed V_5 which is less than V_1.

18. The air-jet texturized and linearly stabilized yarn product obtained by the process of claim 1, said yarn product having a boiling shrinkage of less than 3.3% and an instability of less than 1.0%, measured as the percentage increase in yarn length of a sample having an initial length of one meter under a base load of 1/100 g/den after being subjected to a load of ½ g/den for 30 seconds and then relieved again to the base load of 1/100 g/den for another 30 seconds.

Re. 32,048

TIE BAR ADJUSTMENT SYSTEM

Edgar D. Prince, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

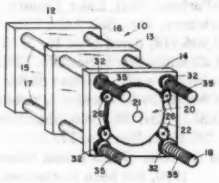
Original No. 42,561,662, dated Mar. 17, 1981, Ser. No. 2,612, Jan. 11, 1979. Application for reissue Aug. 30, 1982, Ser. No. 412,791

Int. Cl.[4] B22D *17/26*

U.S. Cl. 164—154 **22 Claims**

21. In a die casting machine including front and rear end plates, a plurality of tie bars extending between said end plates, a traveling plate slidably positioned on said tie bars for movement between said end plates, each of said tie bars secured to one end plate by external threads positioned at one end of the tie bars, rotatable threaded adjustment nuts coupled to said one end plate and engaging said threads for adjustment of said tie bars, said adjustment nuts including external gear teeth, an idler gear for each of said adjustment nuts and engaging the external gear teeth of said adjustment nut, a centrally positioned bull gear for rotating said idler gears and adjustment nuts; drive means for said bull gear, the improvement comprising:

separate means for selectively and individually moving each of said idler gears from a first position engaging said bull gear and an associated adjustment nut and a second position disengaging said bull gear and said associated adjustment nut; said means for moving said idler gears including shaft means for rotatably and slidably mounting each of said idler gears to said one end plate for movement between said first and second positions; said moving means



for each of said idler gears further including a cylinder for sliding said edler gear on said shaft means between said first and second positions; a control circuit means coupled to said drive means for said bull gear and each of said cylinders; and said control circuit means including a separate control circuit for each of said tie bars; each of said separate control circuits including a detecting means for each of said tie bars for detecting a parameter directly relating to and representing the tension on an individual tie bar; said separate control circuits each being coupled to one of said cylinders for selectively coupling one or more threaded adjustment nuts with said bull gear for selectively adjusting said tie bars for automatically, selectively and individually adjusting the tension of each of said tie bars within prescribed limits.

Re. 32,049

ELECTRICAL CONTACT ARRANGEMENT FOR PHOTOGRAPHIC CAMERA WITH INTERCHANGEABLE LENS

Zenichi Okura, Chiba; Yasuyuki Haneishi, and Shinsuke Kohmoto, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 4,357,089, dated Nov. 2, 1982, Ser. No. 237,987, Feb. 25, 1981. Application for reissue Dec. 2, 1983, Ser. No. 557,540

Claims priority, application Japan, Feb. 26, 1980, 55-24447[U]

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—286 **32 Claims**

17. An interchangeable lens engageable with a camera body comprising:

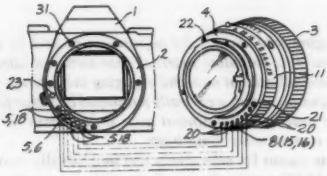
a bayonet connection for engaging a camera body;

an annular lens mount having a flat surface surrounding the bayonet connection;

a first electrical contact in the lens mount movable normal to the flat surface between a retracted position approximately flush with the flat surface and an extended position projecting from the flat surface;

spring means for urging the first contact toward the extended position; and

one or more stationary insulative regions in the lens mount opening toward the flat surface without protruding therefrom,



the location of the insulative regions being representative of specific diaphragm values.

Re. 32,050

PROCESS FOR DE-BONING MEAT OR FISH

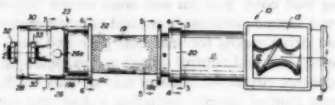
Archie R. McFarland, Salt Lake County, Utah, assignor to Beehive Machinery, Inc., Salt Lake City, Utah

Original No. 3,906,118, dated Sep. 16, 1975, Ser. No. 368,190, Jun. 8, 1973. Continuation of Ser. No. 129,395, Mar. 11, 1980, abandoned, which is a continuation of Ser. No. 881,686, Dec. 3, 1969, Pat. No. 3,739,994, which is a continuation-in-part of Ser. No. 593,532, Nov. 10, 1966, abandoned. Application for reissue Jun. 25, 1981, Ser. No. 277,082

The portion of the term of this patent subsequent to Jun. 26, 1990, has been disclaimed.

Int. Cl.[4] A23L *1/31, 1/325*

U.S. Cl. 426—479 **7 Claims**



1. A process for de-boning ground meat or fish material containing soft fleshy matter and [boney] *bony* components, comprising the steps of introducing under pressure such a material into the feed end of a perforated de-boning conduit of circular cross-section and open for discharge of material at the opposite end, said conduit containing a rotary compression screw extending along its length and through the open discharge end thereof; conveying said material toward said discharge end of the conduit by means of said screw while maintaining said pressure, so as to compress said material within said conduit, whereby [boney] *bony* components are retained in and passed along said conduit as a filter mat through which soft fleshy matter is forced toward and expelled through the perforations of the conduit; *maintaining sufficient clearance between said screw and said perforated conduit to maintain a thin coating of said bony components on the inner wall portions of said conduit between said screw and said conduit;* selectively restricting [said] flow from the discharge end of the conduit circumferentially of and around the discharge end of said screw to increase the pressure within said conduit; and positively passing said filter mat through said open discharge end of said conduit circumferentially of and by means of said discharge end of the screw for discharge from the conduit.

Re. 32,051

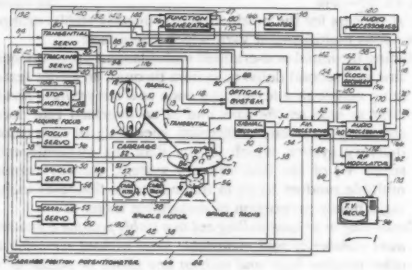
TRACKING SYSTEM AND METHOD FOR VIDEO DISC PLAYER

Ludwig Ceshkovsky, Fountain Valley, and Wayne R. Dakin, Costa Mesa, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Original No. 4,332,022, dated May 25, 1982, Ser. No. 130,904, Mar. 17, 1980. Division of Ser. No. 890,670, Mar. 27, 1978, abandoned. Application for reissue Jun. 11, 1984, Ser. No. 619,259

Int. Cl.[4] C11B *21/10*

U.S. Cl. 369—44 **16 Claims**



2. A tracking system for use in a player for recovering information from a selected one of a plurality of spaced information tracks on an information-bearing surface, the player including means for providing a beam of radiation and means for imparting relative movement between the surface and the beam, the tracking system comprising:

beam steering means for directing the beam of radiation along a prescribed path to impinge on the information-bearing surface; and

control means for coupling a tracking error signal to the beam steering means, in a first mode of operation, to controllably position the beam of radiation in alignment with a first selected track on the surface;

the control means further operating, in a second mode of operation, to uncouple the tracking error signal from the beam steering means, and to couple a control pulse signal to the beam steering means, to controllably move the beam of radiation toward a second selected track on the surface;

the control means including detector means for determining when the beam of radiation has been moved to a prescribed position intermediate the first track and the second track, and for terminating the control pulse signal at that time;

said control means recoupling the tracking error signal to the beam steering means before the beam of radiation reaches the second selected track.

PLANT PATENTS

GRANTED DECEMBER 17, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,598
IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 14

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,801
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant known by the cultivar name Vista Impatiens No. 14, as described and illustrated, and characterized by its intensely brilliant, large orange flowers, profuse year-round flowering even in high light and high temperature conditions, highly variegated foliage that retains its variegation year-round, vigorous and fast rate of growth, and tall, upright self-branching habit which makes it ideal for bedding plants, pot plant culture and hanging baskets.

5,599
AFRICAN VIOLET PLANT NAMED SOUTH DAKOTA

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,650
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new cultivar of African violet named South Dakota, as described and illustrated, and particularly characterized by its vigorous growth habit, profuse bouquet positioned on upright flower stems; deep violet purple flower color, with the centers of the flower being relatively darker; single flower form; dark green leaves, and its long lasting and non-dropping flowers.

5,600
AFRICAN VIOLET PLANT NAMED IMPROVED OREGON

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,439
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Improved Oregon, as illustrated and described, and particularly characterized by its vigorous growth habit, abundance of upright wire-like flower stems each of which produces 7–9 flowers having frilled edges and intensive pink flower color, profuse flowering, long lasting and non-dropping flowers, and by its dark green, generally round and finely serrated leaves.

5,601
AFRICAN VIOLET NAMED SEQUOIA

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA" , Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,441
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Sequoia, as described and illustrated, and particularly characterized by its vigorous growth habit, dark green and shiny leaves, strong upright flower stems, each carrying 7–9 or more double frilled flowers, purple violet in flower color; profuse flowering habit, and its ability to produce a saleable attractive plant with a full flower head within 8–10 weeks after potting.

5,602
AFRICAN VIOLET PLANT NAMED IMPROVED LOUISIANA

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,442
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Improved Louisiana, as illustrated and described, and particularly characterized by its compact growth habit, strong and upright flower stems, frilled flowers which are light pink accentuated with darker pink spots around the center and in certan instances darker pink at the edges, and by its dark green and indented leaves.

5,603
AFRICAN VIOLET PLANT NAMED BALTIMORE

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,443
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Baltimore, as described and illustrated, and particularly characterized by its very compact growth habit, girl type leaves, wire-like flower stems each of which carries seven or more flowers, white flower color, with purple tinging at the center of each petal and around the edges of certain of the petals, very long lasting flowers which do not drop, and by its ability to be grown close together with other plants without leaf stretching.

5,604
AFRICAN VIOLET PLANT NAMED BETTY

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,444
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Betty, as described and illustrated, and particularly characterized by its compact growth habit, dark green serrated leaves, strong, upright flower stems, each of which carries 5–7 and more flowers, the flowers being frilled and waved and mainly white in color with dark purple centers, uniform growth habit, long lasting and non-dropping flowers, and its ability to produce a saleable plant with a fully developed flower head 8–10 weeks after potting.

5,605
AFRICAN VIOLET PLANT NAMED IMPROVED ALABAMA

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Ergindergemeinschaft "OPTIMARA", Rees Haffen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,445
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Improved Alabama, as illustrated and described, and particularly characterized by its vigorous and compact growth habit, strong and upright flower stems each of which carries 7–9 or more relatively large white-purple variegated frilled flowers, and by its relatively dark leaves.

PATENTS

GRANTED DEC. 17, 1985

ERRATA

For CLASS	See PATENT NO.
228–183	4,558,695
081–025	4,558,726
423–112	4,559,203
423–167	4,559,204
204–158	4,559,371
333–001	4,559,489
333–083	4,559,490
337–194	4,559,504
333–181	4,559,506
355–003	4,559,509

PATENTS

GRANTED DECEMBER 17, 1985

GENERAL AND MECHANICAL

4,558,466

VEST FOR USE IN POLLUTED ATMOSPHERE

Jan A. A. Kristensson, Syrenvägen 1, S-262 00 Ängelholm, Sweden

Filed Aug. 4, 1983, Ser. No. 520,506
Claims priority, application Sweden, Aug. 5, 1982, 8204591
Int. Cl.⁴ A41D *13/00*
U.S. Cl. 2—2 **4 Claims**

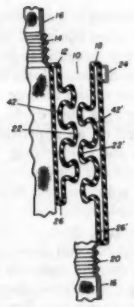
1. A vest for use in a polluted atmosphere, comprising:
(a) an air-permeable portion located at the upper part of the vest;
(b) an air-tight portion located in the lower part of the vest to form an air distribution zone; and
(c) an air supply connection connected to the lower part of the vest for supplying fresh air to the air distribution zone and out throught said air-permeable portion,
wherein a fresh air zone is formed outside the vest.

4,558,467

GASTIGHT SEALS FOR RUBBER SUITS

Irving F. Barditch, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 9, 1984, Ser. No. 578,330
Int. Cl.⁴ A63C *11/04*
U.S. Cl. 2—2.1 R **2 Claims**



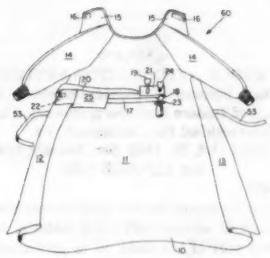
1. A gastight seal for rubber suits which comprises:
a first, male, rubber bladder having a plurality of male outer annular protuberant rings, located about the outer circumference of the suit's male bladder portion, containing a viscid material, attached to a first pleated bellows-like section of a main body of the rubber suit;
a second, female, rubber bladder having a plurality of female inner annular protuberant rings located about the inner circumference of such suit's female bladder portion, containing a viscid material attached to a second pleated bellows-like section of a main body of the rubber suit said male bladder rings and female bladder inner rings sealingly mating with one another as said first bladder is tucked into said second bladder;
a strap or other means attached to said second rubber bladder for applying pressure to the viscid material in the second rubber bladder to stiffen and interlock its annular rings with said annular rings of the first rubber bladder which seals said first pleated bellows-like section to second pleated bellows-like section of the rubber suit.

4,558,468

SURGICAL GOWN HAVING ONE-PIECE-BELT SYSTEM

Anne D. Landry, Cincinnati, and Albert L. Bayes, Cleves, both of Ohio, assignors to The Kendall Company, Boston, Mass.

Filed Oct. 5, 1984, Ser. No. 658,328
Int. Cl.⁴ A41B *13/10*
U.S. Cl. 2—51 **13 Claims**

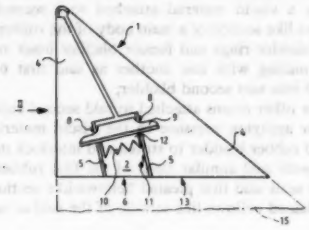


1. A surgical gown of the rear-closure type, comprising:
a gown body, said gown body having a front portion, a first back margin, and a second back margin;
a belt, said belt having a first end, a second end and a middle section; and
means for associating said belt with said gown body, said means comprising means for releasably attaching a segment of said middle section of said belt to said gown body; means for releasably attaching said first end of said belt to said front portion of said gown body; a transfer device; means for releasably attaching said transfer device to said front portion of said gown body; and means for releasably attaching said second end of said belt to said transfer device.

4,558,469
FASHION TRIM ARTICLE

Herbert Richter, Pforzheim, Fed. Rep. of Germany, assignor to Herbert Richter Metallwaren-Apparate bau GmbH & Co., Pforzheim-Bü, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 639,724
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 8323502[U]
Int. Cl.⁴ A41D *27/16*
U.S. Cl. 2—60 **6 Claims**



1. A fashion trim article for the protection and decoration of corner areas of cloth such as collars of jackets and shirts, said trim article consisting of an enclosure comprising a front plate and back plate sections arranged spaced from the front plate by side walls, said front and back plate sections and said side walls being formed from stamped metal bent up and over to form said side walls and said back plate sections, said back plate sections having portions bent outwardly so as to provide an opening therebetween and to form opposite parallel bearing walls projecting from said back wall sections, said bearing walls having axially aligned bores formed therein, and a retaining flap having bearing pins pivotally supported in said bores of said bearing walls, said retaining flap having an operating lever and a tab projecting inwardly into said opening in said back plate sections between said bearing walls for engaging therein cloth material introduced between said front plate and back plate sections.

4,558,470
SHOCK ATTENUATION SYSTEM

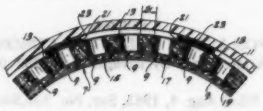
Hal D. Mitchell; Richard W. Glover; Donald R. Walker, all of Rolla, Mo., and Isadore Rosenberg, Downey, Calif., assignors to Figgie International Inc., Richmond, Va.

Filed Oct. 26, 1982, Ser. No. 436,654
Int. Cl.⁴ A42B *3/02*
U.S. Cl. 2—414 **12 Claims**

1. Protective apparatus for the body comprising:

an outer shell of substantially rigid material adapted to be worn on a part of the body to be protected such as the head;

a shock attenuation system on the inside of the shell comprising a plurality of pads adapted for engagement with the head, each pad comprising a multiplicity of spaced-apart resilient columns each constituted by a hollow integrally formed one-piece tubular member of resilient synthetic resin material haivng a slenderness ratio of less than 3.0, the slenderness ratio being the ratio of column length to column diameter, and a layer of cushioning material occupying the spaces between the columns having a thickness generally corresponding to the height of the columns, said columns being so dimensioned and configured that, when subjected to an axial impact load of predetermined magnitude, the walls of the columns are adapted resiliently to buckle in irregular and random fashion for attenuating the shock resulting from said impact load, said columns then being adapted resiliently to return substantially to their undeformed shape; and means for fastening each pad to

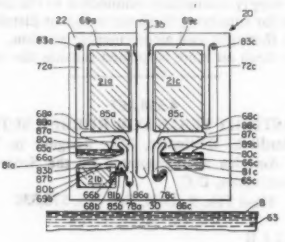


the inside surface of the shell with said columns generally at right angles to the shell.

4,558,471
PASSIVE DOSING DISPENSER FEATURING HIGH STRENGTH INITIAL CLEANING ACTION

Bruce Brown, and Wilbur C. Strickland, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 20, 1984, Ser. No. 632,779
Int. Cl.⁴ E03D *9/02*
U.S. Cl. 4—228 **16 Claims**



1. A dispenser for cleaning and maintaining the cleanliness of a toilet bowl of a flush toilet equipped with a toilet tank reservoir, said dispenser being adapted to be located in the toilet tank reservoir and to co-dispense doses of two or more chemical solutions in response to the change in water level in said toilet tank reservoir during a flush cycle, said dispenser having an operational life based on an approximately predetermined number of flush cycles and comprising:

(a) a first internal reservoir for containing a quantity of first chemical cleaning solution, said first reservoir containing a quantity of a soluble, solid-state first chemical sufficient to provide a saturated dose of first chemical cleaning solution in response to each flush cycle throughout said operational life to thereby maintain bowl cleanliness, and further comprising a first liquid dispensing passageway in fluid communication with said first reservoir for conveying said dose of first chemical solution to the water in said toilet tank reservoir in response to said change in water level during each flush cycle, and a first air vent in fluid

communication with said first reservoir, both said first dispensing passageway and said first air vent including passive means for providing isolation of said first chemical solution from said toilet tank reservoir water during quiescent periods between flushes; and

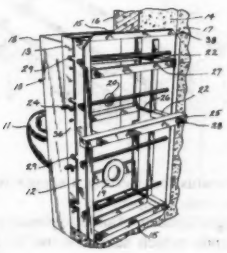
(b) a second internal reservoir for containing a quantity of second chemical cleaning solution, said second reservoir containing a quantity of soluble, solid-state second chemical sufficient to provide a saturated dose of second chemical cleaning solution in response to each flush cycle during at least a portion of said operational life of said dispenser, thereby providing additional concentration of chemicals within said bowl to facilitate the loosening of established organic soil deposits on contacting toilet bowl surfaces, and said second reservoir further comprising a second liquid dispensing passageway in fluid communication with said second reservoir for conveying said dose of second chemical solution to the water in said toilet tank reservoir in response to said change in water level during each flush cycle throughout said portion of said operational life, and a second air vent in fluid communication with said second reservoir, both said second dispensing passageway and said second air vent including passive means for providing isolation of said second chemical solution from said toilet tank reservoir water during quiescent periods, and said second dispensing passageway being connected at its lower end to the lower portion of said first dispensing passageway and thereby having a common dispensing outlet therewith such that first chemical solution discharged through said first liquid dispensing passageway facilitates discharge of said second chemical solution through said second liquid dispensing passageway.

4,558,472

ADJUSTABLE WALL SLEEVE

Klaus J. Fromme, Milwaukee, and Roger D. Champagne, Menomonee Falls, both of Wis., assignors to Bradley Corporation, Menomonee Falls, Wis.

Filed Oct. 24, 1984, Ser. No. 664,406
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—252 R **18 Claims**



1. A telescoping wall sleeve for supporting fixtures in a wall opening of a high security environment comprising:

a first frame member having spaced apart wall members defining an opening;

security bars fixed to said wall members and extending across said opening;

a second frame member having substantially the same geometric configuration as said first frame member, said second frame member constructed and arranged to telescope with respect to said first frame member;

a third frame member having substantially the same geometric configuration as said second frame member, said third frame member constructed and arranged to telescope with respect to said second frame member, two of said frame members having flange members for adjustable positioning by means of said telescoping relationship with respect to outside wall surfaces of said wall opening;

slot means operatively positioned with respect to said frame members to permit said frame members to pass over said security bars; and

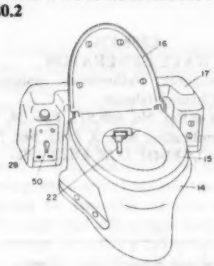
securing means adapted to fasten said frame members in said opening in said wall in an adjustable manner so that said flange members can be aligned with an outside wall surfaces to compensate for wall thickness and wall thickness tolerances.

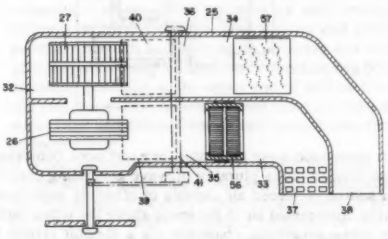
4,558,473

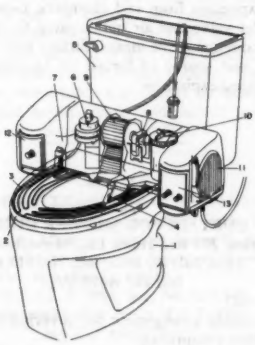
SANITARY CLEANING EQUIPMENT

Yoshitaka Morikawa, Yamatokoriyama, and Hiroyuki Matsui, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00080, § 371 Date Nov. 15, 1983, § 102(e) Date Nov. 15, 1983, PCT Pub. No. WO83/03272, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 16, 1983, Ser. No. 557,165
Claims priority, application Japan, Mar. 17, 1982, 57-43441; Mar. 17, 1982, 57-43442; Mar. 17, 1982, 57-43446
Int. Cl.[4] A47K *4/00, 3/20;* **A61H** *35/00;* **E03D** *9/08*
U.S. Cl. 4—420.2 **12 Claims**







1. Sanitary cleaning equipment for use with a toilet which accommodates a human body in a seated position, comprising:

flushing means for directing a jet of water against an area of said body to be cleaned; and

deodorizing and drying means for selectively withdrawing odoriferous air from the neighborhood of said area to be cleaned and for directing a jet of warm air against said area to be cleaned, said deodorizing and drying means including

a fan,

a first wind tunnel leading toward said fan to convey said odoriferous air thereto, said first wind tunnel having means for receiving a deodorant therein,

a heater,

a second wind tunnel within which said heater is mounted, said second wind tunnel leading from said fan to receive air for said jet of warm air, and

manually actuable damper means for selectively permitting either said first wind tunnel or said second wind tunnel to communicate with said fan so that said fan selectively withdraws said odoriferous air through said first wind tunnel or supplies said jet of warm air through said second wind tunnel.

4,558,474

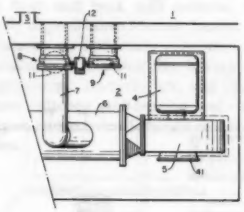
WAVE GENERATOR

Dirk Bastenhof, Langerak, Netherlands, assignor to Ecopool Design Limited, Channel Islands

Continuation-in-part of Ser. No. 469,521, Feb. 24, 1983, Pat. No. 4,467,483. This application Aug. 3, 1983, Ser. No. 520,078

Int. Cl.⁴ E04H *3/18*; E02B *3/00*

U.S. Cl. 4—491 **19 Claims**



1. A pneumatic wave generator for a surf pool, comprising a caisson divided into a plurality of wave generating chambers, and a source of forced air capable of effecting aspiration by applying compressed air to the space above the water surfaces in the wave generating chambers via a conduit system provided with an air inlet valve for said aspiration and an air outlet valve for expiration from said chambers, means for coupling each air inlet valve and air outlet valve to operate together through a common drive means, further including means for connecting said source of forced air to apply suction to a chamber during expiration.

4,558,475

CURTAIN FOR SHOWER DOORS

Kay I. O'Brien, 209 Red Hawk La., Marshfield, Wis. 54449

Filed Jul. 19, 1983, Ser. No. 515,137

Int. Cl.⁴ A47K *3/22*

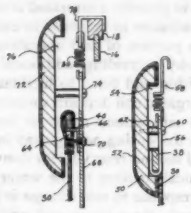
U.S. Cl. 4—607 **9 Claims**

1. A curtaining arrangement for covering a shower or tub enclosure door comprising:

a curtain positioned across said door and having a rod pocket across each end thereof;

a rod extending through each of said rod pockets adjacent the top and bottom of the door;

a plurality of attachment members at the top and bottom of the curtain, each of said attachment members including first means engaging said rods and second means engageable with the top or bottom of the door for retaining the curtain on the door; and



means extending beyond the ends of said curtain for covering said rods and attachment members, said covering means comprising a solid beam-like member having a covering, said member being fastened to said attachment members.

4,558,476

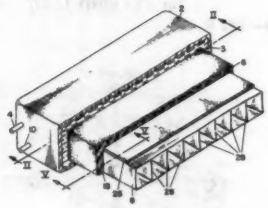
FLOTATION TYPE APPARATUS AND METHOD FOR SUPPORTING A LOAD

Philip C. Linder, 7454 Telegraph Rd., Montebello, Calif. 90640

Filed Oct. 11, 1983, Ser. No. 540,639

Int. Cl.⁴ A47C *27/08, 27/18*

U.S. Cl. 5—450 **7 Claims**



1. A flotation apparatus for exerting a supportive force to support one or more loads comprising:

means for confining a liquid at adjustable pressure having an upper surface upon which said load or loads may be placed;

means for adjusting said pressure of said liquid so that the forces supporting said load may be varied;

a resilient material located within said means for confining said liquid for supporting said load in conjunction with said liquid;

means for confining a gas at adjustable pressure located within said means for confining said liquid for supporting said load in conjunction with said resilient material and said liquid;

means for adjusting the pressure of said gas to further vary said forces supporting said load; and

rigid means located between said resilient material and said means for confining a gas for providing rigidity to the means for confining a gas.

4,558,477

PROCESS FOR WASHING FIBRE STOCK

Frey Sundman, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Division of Ser. No. 163,648, Jun. 27, 1980. This application Jan. 25, 1982, Ser. No. 342,056

Claims priority, application United Kingdom, Sep. 26, 1979, 7933408

Int. Cl.[4] D21C *1/02*

U.S. Cl. 8—156 9 Claims

1. A process for washing fibre stock having a consistency in the range of 2 to 8%, wherein the stock is passed from an inlet end to an outlet end along a substantially horizontally disposed longitudinally extending filter screen portion curved so as to be upwardly concave in cross-section; washing liquid is introduced into the stock in the space defined by said screen portion at least in a region longitudinally remote from said inlet by means of a longitudinally extending liquid supply member fixedly mounted so as to be downwardly radially displaced from the axis of curvature of said screen portion and immersed in said stock, and said screen portion is moved around said axis of curvature whereby the stock is subjected to a tumbling action as it passes along the screen portion and the cylindrical screen is filled with stock to up to 60% of its volume.

4,558,478

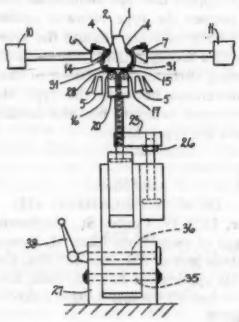
DEVICE FOR TENSIONING A SHOE UPPER ON A LAST AND FOR LAYING ITS LASTING MARGIN OVER IN THE BALL AND SHANK REGION

Gerhard Giebel, Bad Soden, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Apr. 6, 1984, Ser. No. 597,450

Int. Cl.[4] A43D *21/12*

U.S. Cl. 12—81 7 Claims



1. A lasting machine for tensioning a shoe upper on a last and for laying its lasting margin over in the ball and shank region comprising,

a pair of presser members each adapted to be displaced from a remote position to an operative position forcefully engaging a side surface of the last,

a pair of stretchable bands,

means for securing one end of each of said bands to its associated presser member,

first cylinder means including first rod means having means for clamping the other end of each of said bands, said first rod means being displaceable from a first position to a second position for stretching said bands, and

second cylinder means including second rod means having a pair of roller means, said second rod means being displaceable from a retracted position to an advanced position displacing said belts to a position adjacent the insole.

4,558,479

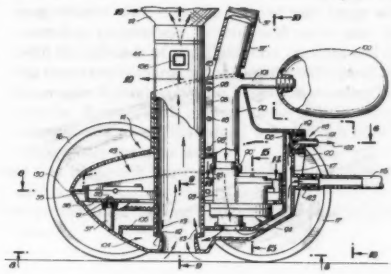
POOL CLEANER

Paul Greskovics, Manhattan Beach, and Donald R. Chivens, Northridge, both of Calif., assignors to Alopex Industries, Inc., San Marcos, Calif.

Filed Jan. 26, 1984, Ser. No. 574,293

Int. Cl.[4] E04H *3/20*

U.S. Cl. 15—1.7 61 Claims



1. A pool cleaner for travel along submerged surfaces of a swimming pool to collect and dislodge debris, comprising:

a cleaner housing;

a drive assembly including a plurality of wheels positioned outside said housing for supporting and driving the cleaner, axle means extending from within said housing to outside said housing and connected to said wheels outside said housing, and a drive train substantially encased within said housing for rotatably driving at least one of said wheels through said axle means; and

a vacuum system including a collection bag and means for inducing a water flow from a submerged surface of the pool into said bag for drawing debris from within the pool into said bag for collection, said vacuum system further including a suction mast mounted on said housing and defining an open flow path from a lower end positioned generally beneath said housing to an upper end disposed generally above said housing, said collection bag being for mounting generally at the upper end of said suction mast and said water flow inducing means being for drawing the water flow and debris through said suction mast into said collection bag;

said drive assembly and said axle means and said wheels comprising a preassembled unit, and said housing comprising a generally upwardly open and shell-shaped housing base including means for seated reception of said drive train, said suction mast being joined with said housing base and projecting upwardly therefrom, said housing further including a pair of mating and generally shell-shaped cowlings together defining a generally downwardly open housing portion sized to fit with close tolerance about said suction mast and in conformance with said housing base to encase said drive train, and further including means for securing said housing base, said suction mast, and said cowlings with respect to each other.

4,558,480

APPARATUS FOR CLEANING A CURVED GLASS SHEET

Masaharu Okafuji, Maizuru; Yoshinori Ochi, Nishinomiya; Atsushi Miyake, Maizuru; Junichi Noguchi, Maizuru, and Ichiro Matsuo, Maizuru, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jul. 5, 1984, Ser. No. 627,769

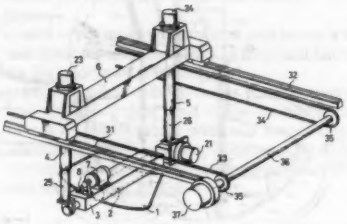
Claims priority, application Japan, Jul. 5, 1983, 58-122197

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—77 13 Claims

1. A cleaning apparatus for a curved glass sheet, comprising:

a roll brush for brushing a surface of the curved glass sheet; a support frame for rotatably supporting said roll brush and surrounding said roll brush, said support frame being provided with an opening for bringing part of a surface of said roll brush into contact with the surface of the curved glass sheet; first and second level shift mechanisms for respectively shifting levels at both ends of said support frame such that a rotating shaft of said support frame becomes substantially parallel to the surface of the curved glass sheet; an angular displacement mechanism



for pivoting said support frame such that said opening of said support frame is directed in a direction substantially normal to the surface of the glass sheet; a moving mechanism for moving one of said roll brush and the curved glass sheet such that said roll brush is moved along the surface of the glass sheet; and a control means for controlling drive means of said first and second level shift mechanisms, said angular displacement mechanism and said moving mechanism in accordance with predetermined data.

4,558,481

JOINT GROUTING TOOL

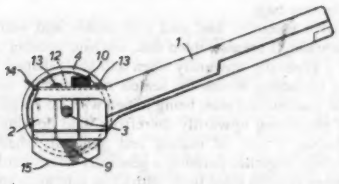
David J. Jones, 27 Pant-Y-ffd Roo, Aberbargoed, Glamorgan, Great Britain

Filed Mar. 5, 1984, Ser. No. 586,359

Claims priority, application United Kingdom, Mar. 5, 1983, 8306128

Int. Cl.⁴ E04G *21/20*

U.S. Cl. 15—105.5 **4 Claims**



1. A joint grouting tool for grouting joints in brickwork and comprising a mounting body having an upper and a lower surface, a handle provided at one end of the mounting body and projecting upwardly at an angle from the body, a removable grouting iron fitted to project downwardly below the lower surface of the mounting body, a guide member comprising a pair of wheels mounted on a shaft passing through the mounting body for location of the tool on the surface of the brickwork incorporating the joint and determining the depth of penetration of the grouting iron into the joint, the grouting iron being shaped with a curved working face having a center of curvature on the axis of the shaft, and wherein the upper surface of the mounting provides for attachment of a raking tool having a raking portion projecting beyond the circumference of the wheels and in a direction away from the handle but upwardly at an angle comparable to that of the handle, so that when the tool is placed in an inverted attitude the raking tool can be moved through joints between the brickwork, as the wheels run over the surface of the brickwork, to perform a preliminary raking action.

4,558,482

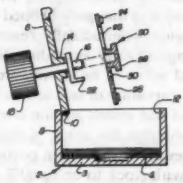
TYPE ELEMENT CLEANER

Eli Neuman, Tarzana, and Lew Whitaker, Pacific Palisades, both of Calif., assignors to Perfectdata, Chatsworth, Calif.

Continuation of Ser. No. 411,330, Aug. 25, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 644,138

Int. Cl.⁴ B41F *35/00*

U.S. Cl. 15—97 R **10 Claims**



1. A type element cleaner for a generally flat type element having a hub, a plurality of radial support arms, and a plurality of print characters respectively disposed on the support arms, the type element cleaner comprising:

a cleaning element having a generally planar cleaning surface;

a container having a generally flat bottom and a recessed portion centrally disposed at the bottom for receiving the type element hub, wherein the cleaning element is positioned on the bottom of the container; and

a support shaft, rotatably connected to the container and oriented generally perpendicular to the container bottom, adapted to support the type element so that axial force on the shaft presses the type element against the cleaning element to cooperatively engage the type element print characters in a facing relationship with the cleaning element cleaning surface and rotation of the shaft provides relative movement between the type element and the cleaning element, wherein ink and contaminants are removed from the type element.

4,558,483

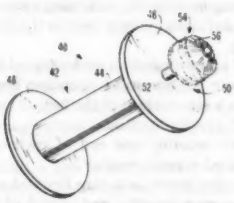
DENTAL BRUSHING AID

Anne M. Noser, 1229 W. Center St., Rochester, Minn. 55901 (now by change of name from Anne M. Rosener)

Continuation-in-part of Ser. No. 467,785, Feb. 18, 1983, abandoned. This application Jan. 23, 1984, Ser. No. 572,834

Int. Cl.⁴ A46B *5/02, 15/00*

U.S. Cl. 15—167 R **13 Claims**



1. A dental brushing aid comprising:

(a) handle means including an easily graspable gripping portion;

(b) a terminal end portion carried by said handle means, including brush means substantially circumferentially surrounding said end portion; wherein said terminal end

portion includes a central stem; and wherein said brush means comprises bristles radiating outwardly from all sides of said stem;

(c) a first enlarged portion disposed between said gripping portion and said end portion;

(d) a second enlarged portion disposed at the opposite end of said handle means away from said terminal end portion;

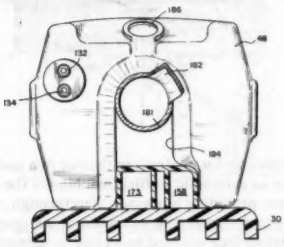
wherein said first and second enlarged portions are adapted to prevent said terminal end portion and said handle means from traveling into the throat of a user of the aid and blocking the air passage of said user.

4,558,484

TANK UNIT FOR CLEANING DEVICES

Hugh F. Groth, Richfield, Ohio, assignor to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,561
Int. Cl.⁴ A47L *7/00*
U.S. Cl. 15—320 **21 Claims**



1. A cleaning device comprising:

a spray nozzle for spraying cleaning fluid onto a surface;

a cleaning fluid tank having an outlet connected to said spray nozzle;

a suction nozzle for removing fluid from said surface;

separator means having an inlet connected to said suction nozzle, an air outlet and a fluid outlet for separating air from said removed fluid;

waste fluid tank having an inlet;

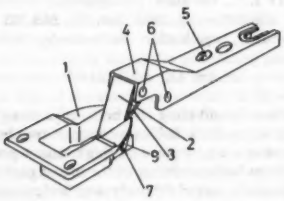
a connector means mechanically connecting said cleaning fluid and waste fluid tanks displaced along a common axis together as a unit and fluidically connecting said separator mean's fluid outlet to said waste fluid tank's inlet.

4,558,485

FURNITURE HINGE INCLUDING C-SHAPED MEMBER FOR MOUNTING HINGE LINKS TO HINGE CASING

Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Mar. 6, 1984, Ser. No. 586,766
Claims priority, application Austria, Mar. 21, 1983, 976/83
Int. Cl.⁴ E05D *3/06*
U.S. Cl. 16—370 **10 Claims**



1. A furniture hinge comprising:

a hinge arm to be mounted on a furniture body;

a hinge casing to be inserted into a recess in a furniture door;

first and second hinge links having first ends pivoted to said hinge arm and second ends pivoted to said hinge casing;

a single C-shaped member pivotally mounting said second ends of said first and second hinge links to said hinge casing, said member comprising a single hinge axle extending through spaced walls of said hinge casing through the interior thereof, transverse portions integral at first ends thereof with opposite ends of said hinge axle and extending transversely thereof, and pivot pins integral with second ends of said transverse portions and extending transversely therefrom and substantially parallel to the hinge axle through said walls of said hinge casing into said interior thereof, with a space between said pivot pins, wherein said pivot pins extend toward each other along substantially the same axis;

said first hinge link being pivotally mounted on said hinge axle; and

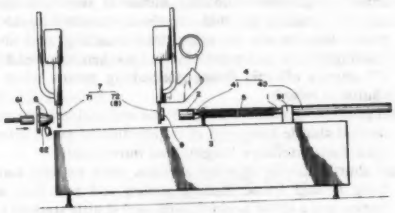
said second hinge link being pivotally mounted on said pivot pins.

4,558,486

SHIRRED CASING DELIVERY APPARATUS FOR MEAT PACKING SYSTEM

Minoru Nakamura, No. 27-6 Seta 1-chome, Setagaya-ku, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,745
Claims priority, application Japan, Nov. 17, 1982, 57-201289
Int. Cl.⁴ A22C *11/02*
U.S. Cl. 17—1 R **11 Claims**



1. A shirred casing delivery apparatus for a meat packing system in which a shirred casing is connected to a nozzle and packed with meat extruded from the nozzle, comprising:

supporting means for supporting the shirred casing from the inner side thereof at a position forward of the direction in which the meat is extruded from the nozzle;

clamping means for holding said shirred casing at an end of the casing facing the nozzle by pressing the shirred casing from the inner side thereof; said clamping means being adapted to reversibly expand within said casing;

drive means for advancing said clamping means holding said casing end toward the nozzle to connect said end of the shirred casing to the nozzle and for subsequently retracting said clamping means; and

resisting means for engaging the wall of the shirred casing when said clamping means is moved in said advancing and retracting directions, and for forming the shirred casing into a straight tubular portion.

4,558,487

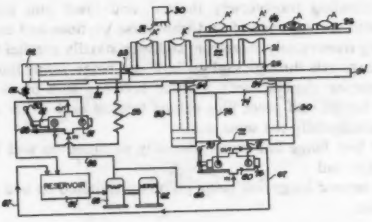
APPARATUS FOR PROCESSING SIMILAR WORKPIECES OF VARYING SHAPE, POINTS OF CONTOUR AND DIMENSION

Norman H. Vogt, Lewiston, Mich., assignor to William T. Sevald, Bellaire, Mich.

Continuation-in-part of Ser. No. 373,441, Apr. 30, 1982. This application Jul. 23, 1984, Ser. No. 633,785

Int. Cl.[4] A22B *5/00*

U.S. Cl. 17—1 R **4 Claims**



1. Apparatus for moving objects sequentially and successively between stations of a production line comprising,

a frame,

at least one loading station and at least first and second work stations at said frame,

a vertically movable platen within said frame below said stations,

a longitudinally movable shuttle on said platen,

at least one loading station and one transfer station on said shuttle corresponding with said frame stations;

vertical power means for raising and lowering said platen with said shuttle thereon relative to said frame,

shift power means for moving said shuttle on said platen to locate said shuttle stations between a home position at said frame loading station and said first work station of said frame and a shunt position at said first and second work stations of said frame;

relatively low object positioning means on said frame at said first and second work stations,

relatively high object holding means at said loading and transfer stations on said shuttle corresponding to said positioning means on said frame enabling said shuttle holding means to deposit objects on when lowered and to lift objects off said frame positioning means when said shuttle is raised;

said positioning means on said frame and said holding means on said shuttle being out of registration to avoid interference during relative longitudinal movement;

said shuttle having a home position with its said stations lying at said frame loading station and said first work station and a shunt position with said shuttle stations lying at said frame first and second work stations;

raising said shuttle via said platen and power means at its home position elevating objects on said shuttle loading station with said shuttle transfer station lifting any objects off said frame holding means at said frame first work station above said frame holding means to avoid interference between said holding means and said positioning means,

outward shunt movement by said shift power means of said shuttle in its elevated position moves objects on said shuttle holding means over said frame positioning means at said frame first and second work stations;

lowering of said shuttle in its shunt position drops said shuttle and holding means below said frame positioning means depositing the objects off said shuttle holding means at said shuttle loading station on to said frame positioning means at said frame first work station and depositing objects from said first work station carried on said shuttle transfer station onto said frame second work station with said shuttle and holding means dropping below interference with said frame positioning means and any objects thereon, and

reverse movement of said shuttle in its lowered shunt position by said shift power means retracts said shuttle to its home position for reloading and recycling.

4,558,488

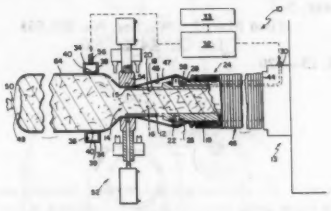
SIZE CONTROL SYSTEM FOR AUTOMATIC SAUSAGE STUFFING

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Jul. 19, 1983, Ser. No. 515,138

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—41 **10 Claims**



1. An apparatus for controlling the size of a casing filled with emulsion in an automatic stuffing machine of the type having a stuffing horn providing a passage therethrough, the horn having a first end for receiving an emulsion, an open second end, and an outer surface adapted to receive a casing sleeved thereover, the casing having a closed end and an open end receiving the second end of the stuffing horn, and means for forcing the emulsion through the horn into the casing, the casing being moved axially along the outer surface of the stuffing horn in response to the emulsion forcing means to allow radial expansion of the casing as it is filled with emulsion, the apparatus comprising an expandable and contractable elastomeric drag member circumferentially disposed about the horn, having an elastomeric drag surface which is radially contractable to a position proximate or below the outer surface of the horn and expandable to a position contacting the inner surface of the casing, fluid supply means for expanding and contracting the elastomeric drag member so that the drag surface contacts and exerts a force against the inner surface of the casing in opposition to movement of the casing, and control means for controlling the fluid supply to the drag member to expand and contract the elastomeric drag surface and to vary the force applied by the drag surface against the casing inner surface, thereby to control the radial expansion and playout of the casing as it is being filled with emulsion.

4,558,489

METHOD AND APPARATUS FOR DIVIDING SLAUGHTERED POULTRY INTO A BACK HALF AND A FRONT HALF

Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Boxmeer, Netherlands

Filed Nov. 18, 1983, Ser. No. 553,383

Claims priority, application Netherlands, Nov. 18, 1982, 8204464

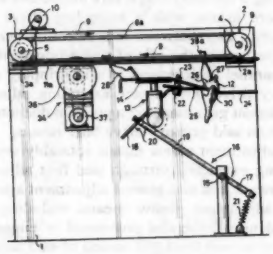
Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—52 **15 Claims**

1. A method for dividing the body of a slaughtered fowl transversally into a back half consisting of two back quarters each comprising a leg, a piece of thigh, and a portion of the back and a front half consisting of the breast part and a major portion of the back part of the body, said body suspended by its legs from a conveying means, being advanced with its breast forwardly directed in the direction of conveyance and being cut to said halves during its conveyance by a cutting operation,

in which, prior to and during said cutting operation, the body is brought into an inclined position relative to said direction of conveyance such that the legs are positioned in front of the rest of the body, while a boundary with the breast forming edge portion of the rear opening of the body present between the legs is pulled away from between the legs, and that said cutting operation is performed in a plane extending between said pulled away edge portion and the thighs.

4. An apparatus suitable for dividing the body of a slaughtered bird into a back half and a front half comprising a conveyor system connected to a frame and adapted for advancing the body of a slaughtered bird to be suspended by its legs, said body passing with its breast in the direction of travel through a cutting apparatus which is joined to the frame and where it is divided into pieces, comprising an arm which is pivotably



mounted to said frame and which, on the supply side of the cutting apparatus, is resisted in its movement by a resistance device above the legs of the body to be advanced, said arm being capable of rotation about a spindle shaft perpendicular to the direction of travel in a vertical plane centrally between the legs from a high position of the free end of the arm as determined by an abutment of the frame, to a lower position thereof and farther removed from the supply side during displacement of the body against at least the free end of said arm, the free end being provided with a gripping element engaging, during downward displacement thereof, the edge portion, forming the boundary of the breast, of the opening present between the legs and the first cutting members of the cutting apparatus dividing the body horizontally into two halves above said gripping element.

4,558,490

POULTRY CUT UP MACHINE

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands, and William L. Wallbridge, To Te Hill Sherfield, Romsey, Hants, England (505 ojn)

Filed Sep. 2, 1983, Ser. No. 529,153

Claims priority, application Netherlands, May 20, 1983, 8301800

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—52 **12 Claims**

4. A method of cutting apart poultry carcasses comprising:

supporting a previously eviscerated carcass from its legs in an inverted attitude;

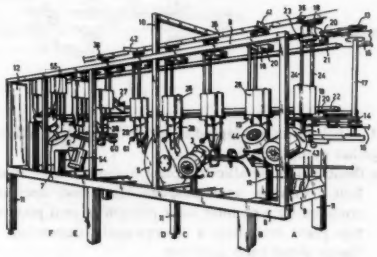
moving the carcass while it is supported from its legs along a processing path,

as the carcass moves along the processing path inserting a mandrel downwardly into the visceral cavity of the carcass to distend the carcass, and while the mandrel is in the cavity cutting the carcass with first rotary cutting discs oriented substantially parallel to the processing path, and then rotating the mandrel and the carcass together about a vertical axis approximately 90 degrees with respect to the direction of movement of the carcass along the processing path and cutting other parts of the carcass with second rotary cutting discs oriented substantially parallel to the processing path.

12. Apparatus for cutting apart previously eviscerated poultry carcasses comprising

a plurality of carcass support modules, conveyor means for continuously moving the modules in spaced series along a processing path,

each of said carcass support modules including a pair of leg support forks for engaging the legs of a carcass to hold the carcass in a legs-up attitude with the opening of the previously eviscerated visceral cavity facing upwardly, and a mandrel above the anticipated position of the opening of the cavity,



means for moving the mandrel downwardly to enter the cavity of the carcass held at the support module and to distend the carcass,

a plurality of cutting means positioned in the processing path for cutting the carcasses, and

means for rotating the carcass support modules in the processing path as the carcasses and support modules move along the processing path to present the carcass at different attitudes to said cutting means.

4,558,491

COMBING MACHINE FOR TEXTILE FIBRES

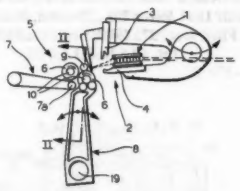
Carlo Ramasco, Sesto Calende, Italy, assignor to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A., Novara, Italy

Filed Jun. 8, 1984, Ser. No. 618,864

Claims priority, application Italy, Jun. 9, 1983, 53445/83[U]

Int. Cl.[4] D01G *19/06*

U.S. Cl. 19—215 **4 Claims**



1. A combing machine for textile fibres, comprising:

means for combing a sliver of fibres;

means for tearing successive tufts from the sliver of fibres as these tufts are combed, the tearing means including at least two contra-rotating tearing rollers;

means for partially super-imposing the torn tufts on each other so as to form a continuous combed web, and

a conveyor belt for conveying the said combed web continuously to the outlet of the machine,

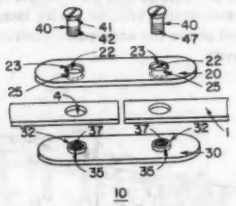
wherein the improvement consists in said tearing rollers being in direct contact with each other and located upstream of the conveyor belt with reference to the direction of advance of the sliver of fibres.

4,558,492

BELT FASTENER

John B. Hite, 3106 Frozen Dog Rd., and Matthew R. Reynolds, 2732 Cherry Cir., both of Emmett, Id. 83617

Filed Apr. 30, 1984, Ser. No. 605,331
Int. Cl.[4] F16G *3/08*
U.S. Cl. 24—37 5 Claims



1. A belt fastener adapted to fasten two ends of a flexible belt together comprising:

a flexible non-metallic top plate having at least two spaced bolt receiving apertures, each of said apertures surrounded by a counter sunk portion of said plate and said top plate including a downwardly depending annular flange about each aperture;

a flexible non-metallic bottom plate having at least two spaced bolt receiving apertures, each aperture in registry with a respective aperture of said top plate; said bottom plate including an upwardly extending annular flange about each bolt receiving aperture, each flange of said bottom plate adapted for insertion into a respective flange of said top plate; and said bottom plate provided with bolt engaging means operable to secure bolts extending through respective apertures of said top and bottom plates to said bottom plate; and

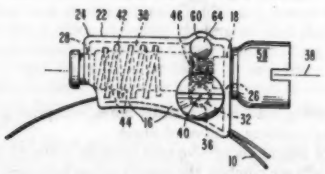
at least two non-metallic bolts, each bolt having a truncated cone-shaped head portion adapted for seating in respective counter sunk portions of said top plate and each of said bolts adapted to extend through respective bolt receiving apertures of said top and bottom plates and through belt openings in registry therewith to engage said bolt engaging means of said bottom plate for securing said plates to the belt.

4,558,493

VARIABLY ACCESSIBLE BAND CLAMP

Ralph Dowdell, 1144 River Rd., Trenton, N.J. 08628

Filed Dec. 27, 1983, Ser. No. 565,690
Int. Cl.[4] B65D *63/02*
U.S. Cl. 24—274 R 12 Claims



1. A variably accessible clamping means comprising:

(a) a band means defining a first end and a second thereof, said band means including a plurality of slot means defined therein, said first end and said second end thereof being in slideable engagement with respect to one another to form said band means into a circular configuration to define a gripping aperture means therethrough and defining a gripping axis therethrough;

(b) an adjustment means attached with respect to said band means to engage the slideably engaged sections of said first end means and adjust the relative positioning thereof, said adjustment means comprising:

(1) a housing means secured with respect to said first end means and extending tangentially with respect to said gripping aperture means, said housing means defining a first adjustment aperture means and a second adjustment aperture means therethrough which define an adjustment bore means extending therethrough in tangential orientation with respect to said gripping aperture means and perpendicularly with respect to said gripping axis, said housing means further defining a first drive aperture means and a second drive aperture means with a primary drive bore means extending therebetween in a direction perpendicularly with respect to the axis of said adjustment bore means and parallel with respect to said gripping axis, said housing means further defining a third drive aperture means and a fourth drive aperture means with a secondary drive bore means extending therebetween in a direction perpendicularly with respect to the axis of said adjustment bore means and parallel with respect to said gripping axis said secondary drive bore means extending adjacent to said adjustment gear means at a position diametrically opposite from said primary drive bore means;

(2) an adjustment screw means rotatably secured in said housing extending through said first adjustment aperture means and said second adjustment aperture means, said adjustment screw means including adjustment thread means thereon positioned in engagement with respect to said band slot means of said second end and responsive to rotation thereof to urge said second end of said band means to move with respect to said first end thereof to adjust the size of said gripping aperture means, said adjustment screw means further including an adjustment gear means therearound positioned adjacent to said drive bore means; and

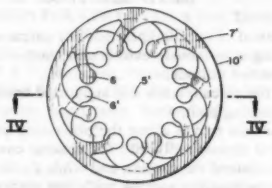
(3) a drive screw means rotatably, securable in said housing and being positionable extending through one of said primary drive bore means and said secondary drive bore means, said drive screw means including drive screw thread means thereon positioned in engagement with respect to said adjustment gear means and responsive to rotation of said drive screw means to cause rotation of said adjustment screw means.

4,558,494

PLASTIC FASTENING COMPONENT

Willibald Kraus, Kaiserslautern, Fed. Rep. of Germany, assignor to TRW United-Carr GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 621,319
Int. Cl.[4] F16L *3/22*
U.S. Cl. 24—297 6 Claims



1. A plastic fastening component for connection to a stud having a threaded exterior comprising a rigid wall connection part having an aperture sized for acceptance of the stud characterized in that the interior space of the aperture includes a plurality of arcuately shaped resilient gripping members which extend axially along the inside wall of the aperture, said gripping members being circumferentially aligned and projecting into the aperture so that axial insertion of said stud causes said

gripping members to resiliently yield to the force of insertion, and grip the threaded exterior of the stud in a manner that permits removal thereof only by unthreading.

4,558,495

HOLDER, ESPECIALLY FOR A DRILL CHUCK KEY

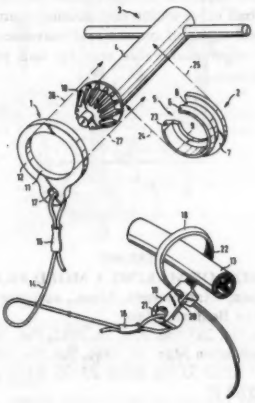
Torhjörn Olsen, P O B 5172, S-533 00 Götene, Sweden

Filed May 23, 1983, Ser. No. 497,276

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222762

Int. Cl.⁴ B23B *45/00*

U.S. Cl. 24—298 **9 Claims**



1. A removable holder for connecting any conventional chuck key, having a circular cross-section shaft with a gearing on one end thereof having a diameter larger than the diameter of the shaft, to a machine with which the key is intended to be used, the holder comprising.

an inner locking device having a generally circular split ring configuration of more than 180° extent and less than 360° extent, the opening in the split ring being smaller than the diameter of the shaft of the chuck key with which it is designed to be used, wherein said inner locking device has an inner diameter which is smaller than the largest diameter of the gearing of the chuck key with which it is designed to be used, said inner locking device being composed of sufficiently resilient material to permit it to be snapped onto the shaft of the chuck key with which it is designed to be used;

an outer mounting ring with an inner diameter greater than the largest diameter of the gearing of the chuck key with which it is designed to be used, and having a predetermined axial thickness; and

connecting means for connecting said outer mounting ring to the machine with which the chuck key is intended to be used,

wherein said inner locking device has an axial length greater than the thickness of said outer mounting ring, and includes a stop flange at one end thereof, an insertion flange at the other end thereof and a groove formed between said stop flange and said insertion flange,

wherein the radial distance from the center of said inner locking device to the outer end of said stop flange is greater than the inner radius of said outer mounting ring, thereby preventing said outer mounting ring from moving beyond said stop flange when in use,

wherein said insertion flange is tapered toward the outer end thereof such that the outer diameter of the endmost portion of the taper is smaller than the inner diameter of said outer mounting ring and the largest outer diameter portion of said taper is greater than the inner diameter of said outer mounting ring portion, said insertion flange being sufficiently flexible to permit said outer mounting ring to be forced thereover; and

wherein said groove has an inner surface with a diameter no larger than the inner diameter of said outer mounting ring.

4,558,496

COMBINED PIN AND NIPPER CHAIN

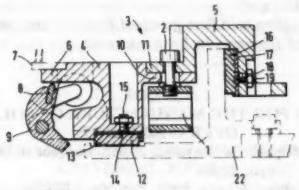
Hans Cramer, Haaren, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,744

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339150

Int. Cl.⁴ D06C *3/04*

U.S. Cl. 26—95 **2 Claims**



1. Combined pin and nipper chain comprising a link forming part of a link chain, a pair of holders detachably fastened on an associated link, one of said holders having a projection carrying a fixed pin strip, said holder also mounting a pivotable nipper carrying a nipper knife which nipper knife can be pressed against the underside of said projection of the holder, characterized in that each of said holders is of U-shaped cross section and each has a lateral projection which overlap and have bores aligned in the overlap region to receive bolts by which the holder parts are detachably connected together and screwable to the respective link.

4,558,497

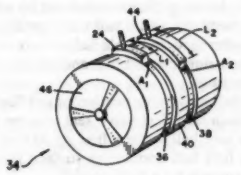
METHOD FOR PRODUCING COMMINGLED CONTINUOUS VARIABLE TEXTURE YARN

Hendrikus J. Oswald, Morristown; Russell H. Butler, Rockaway, and Hsin L. Li, Parsippany, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 357,376, Mar. 12, 1982, Pat. No. 4,467,507. This application Mar. 26, 1984, Ser. No. 593,450

Int. Cl.⁴ D02G *1/20*

U.S. Cl. 28—257 **10 Claims**



1. A method for producing variable texture continuous filament yarn, comprising the steps of:

a. receiving a first group of filaments in a first chamber which has sidewalls, a finite volume and a first moveable perforated filament-receiving means disposed therein;

b. directing a stream of compressed fluid containing said first group of filaments into contact with said first filament-receiving means at a disposition angle relative to said first

filament-receiving means, which ranges from about 15° to 75°, to initiate crimping thereof;

c. receiving a second group of filaments in a second chamber which has sidewalls and a second movable perforated filament-receiving means disposed therein, said second filament-receiving means being moveable at the same rate as said first filament-receiving means, and said second chamber having a volume at least 50% greater than said first chamber volume and having one side-wall thereof in common with one of the sidewalls of said first chamber;

d. directing a stream of compressed fluid containing said second group of filaments into contact with said second filament-receiving means at a disposition angle relative to said second filament-receiving means, which ranges from abiout 15°–75°, to initiate crimping thereof and to provide a shrinkage of said second group of filaments which differs from the shrinkage of said first group of filaments by at least 30%; and

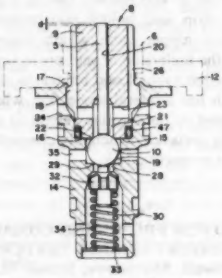
e. commingling said first group of filaments and said second group of filaments to form said yarn.

4,558,498

PROCESS FOR THE MANUFACTURE OF SOLENOID OPERATED VALVE

Yuji Satoh, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 548,874
Claims priority, application Japan, Nov. 12, 1982, 57-198771
Int. Cl.⁴ B21D *53/00*
U.S. Cl. 29—157.1 R **3 Claims**



1. A process for the manufacture of a solenoid operated valve of the type including a first valve seat member having a first valve seat and a first abutting surface, a second valve seat member having a second valve seat and a second abutting surface, said first and second valve seat members being assembled with said respective first and second abutting surfaces thereof in abutment and with said first and second valve seats thereof spaced by a housing chamber defined by said first and second valve seal members, and a ball valve positioned within said housing chamber and movable selectively by a stroke distance to seat alternately on said first and second valve seats, said process comprising:

positioning said ball valve on a portion of saif first valve seat member at which said first valve seat is to be formed;

positioning over said ball valve a first jig having a first end surface and a first ball contacting surface recessed from said first end surface by a first depth;

pressing said first jig toward said first valve seat member until said first end surface of said first jig abuts said first abutting surface of said first valve seat member, and thereby causing said ball valve to press into and deform said portion of said first valve seat member and thus form said first valve seat;

positioning said ball valve on a portion of said second valve seat member at which said second valve seat is to be formed;

positioning over said ball valve a second jig having a second end surface and a second ball contacting surface recessed from said second end surface by a second depth;

pressing said second jig toward said second valve seat member until said second end surface of said second jig abuts said second abutting surface of said second valve seat member, and thereby causing said ball valve to press into and deform said portion of said second valve seat member and thus form said second valve seat;

providing the dimensional relationships that said first depth plus said second depth minus the diameter of said ball valve equals a predetermined said stroke distance; and

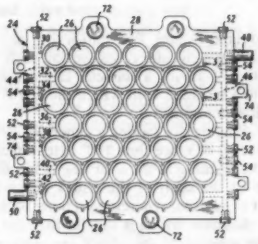
assembling said first and second valve seat members with said first and second abutting surfaces thereof in abutment, with said ball valve within said housing chamber and with said ball valve seated on one said valve seat and spaced from the other said valve seat by said predetermined stroke distance.

4,558,499

METHOD OF MAKING A MOLD FRAME

Robert A. Brown, Mattapoisett, Mass., assignor to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 387,956, Jun. 14, 1982, Pat. No. 4,508,309.
This application Mar. 19, 1984, Ser. No. 590,965
Int. Cl.⁴ B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157.3 R **3 Claims**



1. A method of making a mold frame for receiving a purality of half molds comprising:

(a) forming in a mold plate at least four rows each comprising a plurality of spaced cavities, each cavity being capable of receiving a replaceable half mold, each said half mold when received in each said cavity defining a peripheral fluid passage space between the periphery of the external wall of the mold and the wall of each cavity;

(b) forming a row bore in each row, said row bore interconnecting the cavities in each row and extending beyond the end cavity of each row;

(c) forming two cross bores, one cross bore interconnecting the row bores on one end of the rows and the second cross bore interconnecting the row bores on the other end of the rows;

(d) sealing off said one cross bore between the first and second and the third and fourth row bores and sealing off said second cross bore between the second and third row bores;

(e) forming an inlet to a cross bore at the first row; and

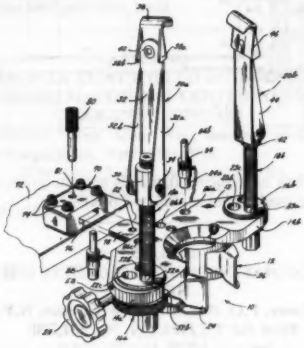
(f) forming an outlet from a cross bore at the last row whereby a serpentine fluid communication is produced between said inlet through the row bore in each row of cavities and out said outlet.

4,558,500

SPRING COMPRESSOR FOR MACPHERSON STRUT SUSPENSION ASSEMBLIES

Kenneth D. Kloster, Maumee, Ohio, assignor to Kloster Research & Development, Inc., Toledo, Ohio

Filed Mar. 16, 1983, Ser. No. 475,905
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—227 **20 Claims**



1. A tool for compressing a helical coil spring of a coil spring/shock absorber suspension assembly wherein the coil spring is positioned about the shock absorber and has one end supported on a spring platform attached to the shock absorber, said tool comprising:

lower clamp means adapted to be secured relative to the shock absorber and having a clamping axis coaxial with the longitudinal axis of the shock absorber;

upper spring engaging means adapted to securely engage a portion of the coil spring;

means for moving said upper spring engaging means toward and away from said clamp means, said means for moving including an elongate threaded shank having one end supported for rotational movement about its longitudinal axis by said clamp means and an opposite end adapted to be threadedly connected to said upper spring engaging means whereby rotation of said shank in one direction causes said spring engaging means to move toward said clamp means and rotation of said shank in and opposite direction causes said spring engaging means to move away from said clamp means, said upper spring engaging means having at least one hook assembly including a hook member having a downwardly facing groove for receiving a portion of the helical coil of the spring and sleeve means for threadedly connecting said hook member to said threaded shank; and

means for adjustably mounting said upper spring engaging means on said clamp means to enable the position of said upper spring engaging means to be adjusted relative to the clamping axis of said clamp means.

4,558,501

CONTACT ALIGNMENT TUBE INSERTION/REMOVAL TOOL

Norbert L. Moulin, Placentia, and James T. Hartley, Santa Ana, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

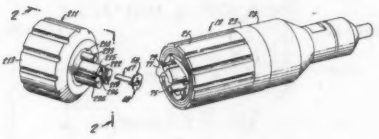
Filed Feb. 1, 1985, Ser. No. 697,372
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—271 **8 Claims**

1. A tool for inserting or removing a tubular member having an asymmetrically configured baseplate into another member having a slotted receptacle for receiving and retaining said baseplate comprising in combination:

(a) a hollow shaft or post for receiving said tubular member up to, but not including, its baseplate;

(b) a core mounted coaxially with and rotatable relative to said shaft;

(c) a shroud extending from said core beyond the tip of said shaft and partially surrounding said shaft; and



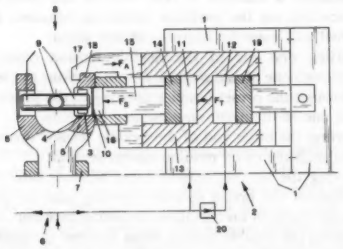
(d) a slot in the end of said shroud lying in a plane orthogonal to the axis of said post or shaft for receiving the baseplate of said tubular member when said core is turned relative to said shaft.

4,558,502

PROCESS AND APPARATUS FOR ASSEMBLING UNIVERSAL JOINTS

Willi Gössmann, Niederwerrn; Gebhard Pape, Schweinfurt; Norbert Klüpfel, Hambach; Emil Ludwig, Sennfeld; Josef Stark, Hambach; Bernhard Bauer, Hassfurt, and Hans Freund, Schwebheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,465
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333665
Int. Cl.[4] B23P *11/00, 19/04*
U.S. Cl. 29—434 **7 Claims**



1. A method for the assembly of universal joints with radially pretensioned fork arms, consisting of the steps of inserting and positioning the joint cross in the joint fork, pressing in the bearing and fixing them by means of pressure units, one of which supports each fork arm and pretensioning each fork arm individually during the entire pressing-in and/or fixing phase by means of the tipping force resulting from the pressure prevailing between the support element and the pressing/peening tool, reduced by a partial force following in response to the amount of the pressing force.

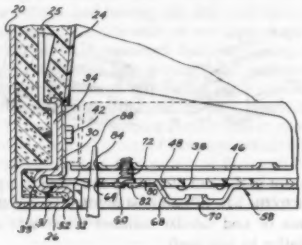
4. An apparatus for assembling universal joints consisting of a machine stand (1) with devices (7) for clamping at least one joint fork (6) and a joint cross (8), two pressure units (2), one of which is assigned to each fork arm (5), each pressure unit having a hook-like support element (17) holding the fork arm (5) from behind, and a pressing/peening tool (16), characterized in that the pressure unit (2) includes a secondary pressure system (12), whose pressure-actuated element (19) is movable in the direction of movement of the main pressure system (11) and is braced against the machine stand (1).

4,558,503

METHOD OF ASSEMBLING A REFRIGERATOR

Arthur C. Wilson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 19, 1984, Ser. No. 622,257
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—446 **5 Claims**



1. A method of assembling a refrigerator cabinet of the type having an outer metal shell with side walls and a front face, an inner liner and a partition separating the freezer and fresh food compartments comprising:

placing an insulated partition assembly across the refrigerator between the freezer and fresh food compartments;

securing a partition mounting bracket on each side of the outer shell adjacent the partition, said brackets each having a portion extending inwardly perpendicular to the side walls of the outer shell with a preset fastener location;

facing the insulation partition with a mullion component having a cutout section at both ends thereof;

forming a flexible metal tension cross member having a preset fastener opening at each end thereof spaced apart a distance such that when the flexible metal tension cross member is fastened at both ends to the preset fastener locations on the partition mounting brackets the outer shell will have the correct cabinet width;

inserting one end of the flexible tension cross member through one of said mullion cutout sections and securing it through the preset fastener opening to the preset location on one of the partition mounting brackets;

inserting the other end of the flexible tension cross member through the other mullion cutout section;

drawing the flexible tension cross member into alignment between the preset fastener opening and the preset fastener location on the other mounting member; and

securing the flexible tension cross member through the preset fastener opening to the mounting member at the preset fastener location.

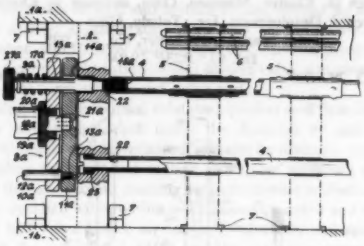
4,558,504

PROCESS FOR FABRICATING NUCLEAR REACTOR FUEL ASSEMBLIES FOR LIGHT WATER NUCLEAR REACTORS

Jacques Le Pargneux; Michel Bonnamour, both of Lyons, and Gérard Filary, Gif sur Yvette, all of France, assignors to Commissarit a l'Energie Atomique and Framatome & Cie, both of Paris, France

Filed Dec. 7, 1982, Ser. No. 447,657
Claims priority, application France, Dec. 14, 1981, 81 33286
Int. Cl.[4] B21D *39/00*
U.S. Cl. 29—452 **2 Claims**

1. A process for the production of a fuel assembly of a light water nuclear reactor, said fuel assembly having a pair of end pieces, said process comprising the steps of first provisionally fixing guide tubes on the end pieces; placing the guide tubes under longitudinal tension without torsion; rigidly fixing grids on said guide tubes; relaxing the longitudinal tension on the guide tubes; disconnecting at least one of the end pieces from



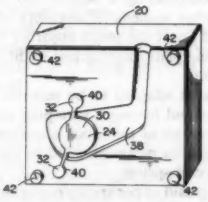
the guide tubes; introducing fuel rods into the grids; and then screwing the guide tubes on the end pieces.

4,558,505

METHOD OF MAKING WEIGHTED METAL GOLF CLUB HEAD

Wildey J. Moore, P.O. Box 4046, New Windsor, N.Y. 12550

Filed Jul. 17, 1984, Ser. No. 631,590
Int. Cl.[4] B22D *11/126, 19/00*
U.S. Cl. 29—527.6 **7 Claims**



1. A method for making a weighted metal golf club head, said method comprising:

providing a weighting insert made of a heavy metal and consisting of a main body and at least one tab portion extending outwardly from said body,

providing a multi-part mold which when closed defines a main cavity having generally the shape of a golf club head and at least one auxiliary cavity for receiving said at least one tab of said insert, said at least one auxiliary cavity being so arranged that when the at least one tab of a weighted insert is placed therein the main body of the insert is located within said main cavity of said mold in spaced relation to the walls of said main cavity,

while said mold is in an open condition placing an insert therein by positioning its at least one tab in said at least one auxiliary cavity,

closing said mold,

introducing melted wax into said main cavity of said mold and letting said wax solidify to form a wax pattern of a golf club head having said insert embedded therein with said at least one tab extending outwardly from said pattern,

removing said wax pattern from said mold,

creating an investment mold from said wax pattern by investing said pattern in liquid investment material, letting said investment material solidify and then heating said solidified material to cure it and melt out the wax of said pattern, the investment mold so created having a cavity in which said insert is supported by said at least one tab which at least one tab is embedded in the investment material of said mold,

casting molten metal into said mold to fill its cavity and surround said main body of said insert,

allowing said metal to solidify,

breaking said investment mold to remove the golf club head defined by said solidified metal, which head has a portion of said at least one tab of said insert extending outwardly therefrom, and

cutting said outwardly extending portion of said at least one tab from said golf club head.

4,558,506

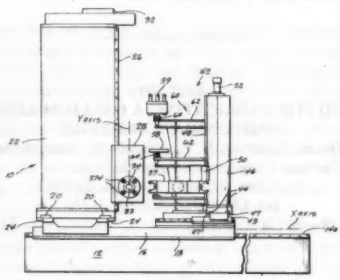
NUMERICALLY CONTROLLED AUTOMATIC TOOL CHANGING MACHINING CENTER HAVING A BAR-TYPE SPINDLE

Ervin J. Kielma, West Allis, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Nov. 9, 1981, Ser. No. 319,781

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **2 Claims**



1. In a tool change mechanism for changing the tools in a cutter supporting spindle of a machine tool; a base; a tool storage magazine mounted on said base and carrying a plurality of tools for use in the spindle; a platform slidably supported by said base for movement in a horizontal path of travel; a tower slidably supported on said platform for movement in a horizontal path perpendicular to the path of travel of said platform so that said tower is movable relative to said base in two mutually perpendicular directions; a carrier slidably supported by said tower for movement in a vertical path; a first pivot journaled in said carrier for pivotal movement; a housing secured to said first pivot for rotation therewith, a second pivot journaled in said housing for rotation about an axis perpendicular to the axis of rotation of said first pivot; a tool change arm secured to said second pivot for rotation therewith; a pair of grips on said tool change arm, each of said grips being operable to retain one of the cutting tools for use in the spindle; platform moving means connected to move said platform in its path of travel for moving said tower and said tool change arm carried thereby between the spindle and said tool storage magazine; tower moving means connected to move said tower and the tool change arm carried thereby toward and away from said magazine; carrier moving means connected to move said carrier in its vertical path of travel along said tower for changing the level of said tool change arm; first pivot actuating means for actuating said pivot to bodily pivot said tool change arm to position it in a horizontal plane for extracting tools from and returning them to said magazine, said pivot also bodily pivoting said tool change arm to position it in a vertical plane for gripping and removing previously used tools from said spindle and presenting new tools from said magazine for use in said spindle; and second pivot actuating means connected to rotate said second pivot for rotating said tool change arm about its axis for exchanging the positions of the tools carried by its grips.

4,558,507

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

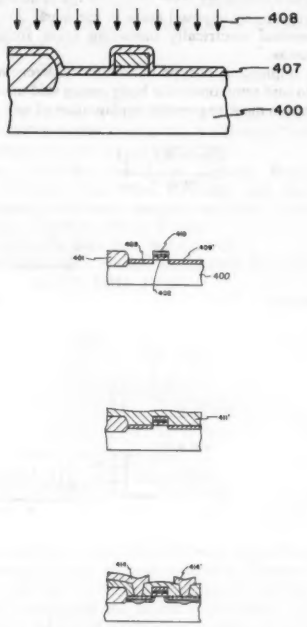
Hidekazu Okabayashi; Mitsutaka Morimoto, and Eiji Nagasawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,913

Claims priority, application Japan, Nov. 12, 1982, 57-198570; Apr. 12, 1983, 58-64085; Apr. 21, 1983, 58-70488

Int. Cl.[4] H01L *29/78, 21/225*

U.S. Cl. 29—571 **11 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of forming a refractory metal silicide film on a limited area of a major surface of a silicon substrate of one conductivity type, forming an insulating film to cover said silicide film, forming an opening with an area smaller than the area of said silicide film by selectively removing said insulating film on a portion of said silicide layer, diffusing an impurity of the opposite conductivity type from the portion of said silicide which is exposed by said opening, said diffusion extending laterally into the entire area of said silicide film and into a portion of said substrate in contact with said silicide film to form a diffused region of said opposite conductivity type in said substrate.

4,558,508

PROCESS OF MAKING DUAL WELL CMOS SEMICONDUCTOR STRUCTURE WITH ALIGNED FIELD-DOPINGS USING SINGLE MASKING STEP

Wayne I. Kinney, Albuquerque, N. Mex.; Charles W. Koburger, III, Underhill, Vt.; Jerome B. Lasky, Essex Jct., Vt.; Larry A. Nesbit, Williston, Vt.; Ronald R. Troutman, and Francis R. White, both of Essex Jct., Vt., assignors to International Business Machines Corporation, N.Y.

Filed Oct. 15, 1984, Ser. No. 660,673

Int. Cl.[4] H01L *21/22, 21/265, 29/78*

U.S. Cl. 29—571 **7 Claims**

1. A process of fabricating an integrated circuit having both

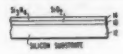
P-well and N-well regions in a single semiconductor body, which process uses only a single lithographic masking step to define the positions of both of said well regions and also the position of doped field regions for controlling the parasitic threshold voltages of portions of said body, comprising:

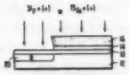
(a) forming a first electrically insulating layer on surface of said semiconductor body;

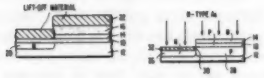
(b) forming on said first layer a second electrically insulating layer from a material preselected to be impervious to oxygen diffusion therethrough;

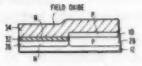
(c) lithographically forming a mask over said second electrically insulating layer to define the position of said N-well regions by exposed areas in the mask, and removing said second electrically insulating layer from said exposed areas;

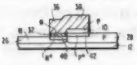
(d) implanting N-type conductivity-determining impurities in said semiconductor body, using said mask as an implantation mask to prevent implantation of said P-well regions;











(e) forming on said first insulating layer over said N-well regions and on the mask over said P-well regions a layer of lift-off material, and then removing said mask over the P-well regions together with the lift-off material thereon;

(f) implanting into said body P-type conductivity determining impurities using said lift-off material as an implantation mask to prevent P-type impurities from reaching into said N-well regions;

(g) removing the removing lift-off material from said N-well regions, and annealing said semiconductor body to form the desired doping profiles in said P and N-well regions, and oxidizing said body to convert only the body portion in said N-well regions into an electrically insulating grown oxide layer, thus forming a step in said body for use as an alignment mark;

(h) implanting said first insulating layer with P-type conductivity determining impurities, using the grown oxide layer over the N-well regions as a mask; and using said second electrically insulating layer over said P-well regions as an etching mask for removing the insulating and oxide layers from over said N-well regions; and

(i) forming a new electrically insulating layer over said N-well regions, and implanting N-type conductivity determining impurities in said new electrically insulating layer over said N-well regions using said second electrically insulating layer over said P-wells as a masking layer to prevent said N-type conductivity determining impurities from reaching said first insulating layer portion positioned over said P-well regions;

thereby producing N- and P-well regions in said body with alignment marks on the surface of said body indicating the separation of said regions and with corresponding field-doped insulating layers over said regions, wherein the doped insulating layer over said N-well regions is doped with predominantly N-type impurities, and the doped insulation layer over said P-well regions is doped with predominantly P-type impurities.

4,558,509

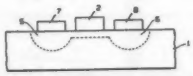
METHOD FOR FABRICATING A GALLIUM ARSENIDE SEMICONDUCTOR DEVICE

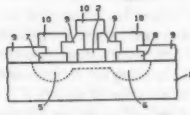
Sandip Tiwari, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,563

Int. Cl.[4] H01L *21/265, 21/20*

U.S. Cl. 29—576 B **11 Claims**





1. A method for fabricating a semiconductor device which comprises:

A. providing a gallium arsenide substrate;

B. providing gate regions positioned on a (100) surface of the substrate in the [011] orientation;

C. ion implanting active impurities into predetermined regions of the gallium arsenide substrate to provide FET source and drain regions which are self-aligned with respect to said gate;

D. annealing subsequent to ion implanting whereby the annealing temperature is greater than the ion implantation temperature whereby said active impurities are caused to diffuse laterally and thereby form channel region beneath said gate;

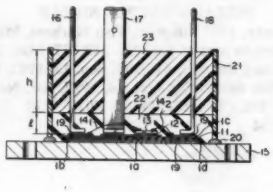
E. delineating contact holes to said gate and to source and drain regions; and

F. depositing and delineating metallic-type high conductively electrical interconnection pattern that makes electrical connection to the gate and to source and drain.

4,558,510
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Keizo Tani, and Masahiro Ogasawara, both of Hyogo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1984, Ser. No. 592,596
Claims priority, application Japan, Mar. 31, 1983, 58-55984
Int. Cl.⁴ H05K *5/06;* **H01L** *23/30*
U.S. Cl. 29—588 **8 Claims**



1. A method of producing a resin-sealed semiconductor device including a semiconductor chip, electrodes connected to said semiconductor chip, and terminals mounted on said electrodes and projecting up from said electrodes, said method comprising the steps of:

covering said semiconductor chip and said electrodes with a layer of silicone gel without contacting said terminals with said silicone gel;

heating said silicone gel layer to a holding temperature to thermally expand said silicone gel layer;

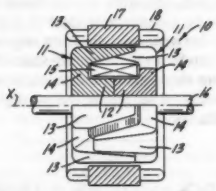
covering said silicone gel layer with a layer of resin having a coefficient of thermal expansion less than that of said silicone gel while maintaining said silicone gel thermally expanded at said holding temperature, said resin contacting said terminals projecting up from said silicone gel layer; and

heating said resin to a curing temperature higher than said holding temperature to cure said resin.

4,558,511
METHOD OF MANUFACTURE OF A MAGNETIC ROTOR CORE MEMBER FOR A ROTATING-FIELD DYNAMOELECTRIC MACHINE

Masa Kato, Ibaragi, Japan, assignor to Kato Iron Works, Ltd., Hitachi, Japan

Filed Jan. 23, 1984, Ser. No. 572,994
Claims priority, application Japan, Apr. 7, 1983, 58-059913
Int. Cl.⁴ H02K *15/02*
U.S. Cl. 29—598 **11 Claims**



1. An improved method of manufacture of a magnetic rotor core member for a dynamoelectric machine of the rotating-field type, the rotor core member including a cylindrical hub section mountable on a rotor shaft, an integral disc section extending radially outwardly from one end of the hub section, and a plurality of annularly spaced integral pole pieces projecting from the outer edge of the disc section in a direction parallel to the hub axis, the method comprising the following steps:

A. hot forging a segment of steel bar stock to form a preliminary core blank having a general approximation of the desired external configuration for the rotor core member;

B. coining the preliminary core blank to form a secondary core blank more closely approximating the desired external configuration for the rotor core member;

C. cooling the secondary core blank;

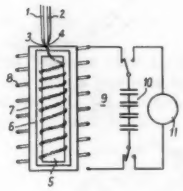
D. cold punching the central part of the secondary core blank to form a shaft aperture therethrough and simultaneously cold compressing the secondary core blank into closer conformity with the required configuration for the rotor core member; and

E. cold compressing the secondary core blank, in a cold forging press, to final form and dimensions to complete a finished rotor core member.

4,558,512
PROCESS FOR MAKING A CONNECTION BETWEEN SUPERCONDUCTIVE WIRES AND TO A CONNECTION OBTAINED BY THIS PROCESS

Jacques Chaussy, Echirolles; Jean-Louis Genicon, Brigoud; Jean Mazuer, Voreppe; Jean Pilon, Grenoble, and André Sulpice, Novalaise, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Jul. 3, 1984, Ser. No. 627,613
Claims priority, application France, Jul. 5, 1983, 83 11147
Int. Cl.⁴ H01L *39/24*
U.S. Cl. 29—599 **3 Claims**



1. Process for making a connection between superconductive wires constituted by one or more strands or filaments of superconductive material embedded in a metallic matrix, in which the metal constituting the matrix is previously eliminated over a certain length of wire, corresponding to the desired zone of contact between the wires, so as to expose the or each strand of these wires, and the linkage is established between the strands by exerting thereon a strong pressure, cold, further comprising the steps wherein the visible superconductive strands of the two wires are applied, near one another, on a support, a strip of superconductive material is applied on the visible strands, a sheath made of a material which is a good conductor of electricity is placed around the assembly constituted by the support, the strands of the superconductive wires and the superconductive strip, and the assembly thus obtained is then subjected to a magnetoforming operation provoking crimping of the outer sheath on the support, with crushing of the superconductive strip on the superconductive strands, thus ensuring the electrical connection of the wires with a very low resistance.

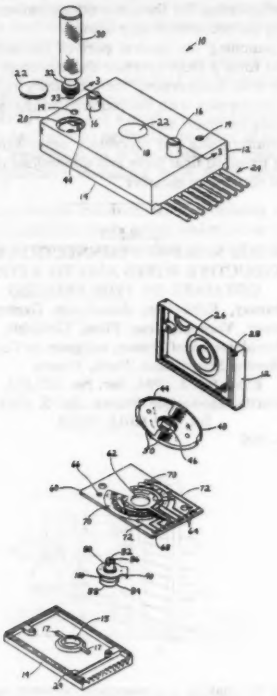
4,558,513
ADJUSTABLE ROTARY SWITCH

Gary L. Buss, Arden, N.C., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 294,374, Aug. 19, 1981, Pat. No. 4,392,030.
This application Apr. 25, 1983, Ser. No. 488,386
Int. Cl.⁴ H01H *11/04*
U.S. Cl. 29—622 **12 Claims**

11. A process for accurately defining the operative position of a rotary switch rotor having contact means relative to a substrate having contact paths arranged in concentric arcuate paths, comprising the steps of mounting the rotor onto a shaft

with the contact means in confronting relationship with said paths, selectively rotating either the rotor or the shaft to effect a fine angular adjustment defining the operative position of the



contact means and contact paths respectively, and thereafter fixedly joining the shaft and rotor to maintain said fine adjustment to maintain the operative relation of the contact means and contact paths.

4,558,514

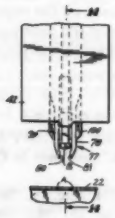
METHOD FOR FILLING PRINTED CIRCUIT BOARDS

Dehart G. Scrantom, Shallotte, N.C., assignor to AVX Corporation, Great Neck, N.Y.

Division of Ser. No. 368,670, Apr. 15, 1982, Pat. No. 4,455,735. This application Apr. 13, 1984, Ser. No. 600,157

Int. Cl.⁴ H05K *3/30*

U.S. Cl. 29—838 **3 Claims**



1. The method of inserting an electronic component, such as a capacitor, having a body and leads extending axially from said body into inserted position within appropriately positioned apertures of a P.C. board comprising the steps of deforming said leads into substantially parallel spaced relation, supporting said component in a bifurcate insertion device having fixedly spaced tines solely by outward spreading forces exerted by said leads against said tines, advancing said insertion device in a path toward an insertion position while applying a further force against said body, said further force being applied in a direction toward the direction of insertion, withdrawing said tines from said leads and thereafter withdrawing said further applied force.

4,558,515

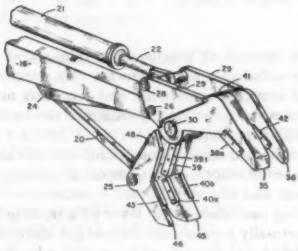
METAL GRAPPLE SHEAR

Roy E. LaBounty, 1607 8th Ave., Two Harbors, Minn. 55616

Continuation-in-part of Ser. No. 238,157, Mar. 2, 1981, abandoned, and Ser. No. 416,902, Sep. 13, 1982, Pat. No. 4,519,135. This application Oct. 14, 1982, Ser. No. 434,428

Int. Cl.⁴ B23P *19/00;* **E02F** *3/28*

U.S. Cl. 30—134 **4 Claims**



1. A heavy duty shear for attachment to the boom structure and hydraulic cylinder of a backhoe, comprising

a lower jaw and an upper jaw and pivot means interconnecting the jaws together, the lower jaw having mounting means for attachment to the boom structure of the backhoe and the upper jaw having bracket means for attachment to the hydraulic cylinder of the backhoe for closing and opening the upper jaw relative to the lower jaw,

the lower jaw having a rigid lower shear blade and a rigid guide blade lying along the shear blade and in spaced relation therewith, the shear blade having a hardened insert bar defining a shearing edge and having a supporting seat carrying said insert bar,

the upper jaw having an upper shear blade extending along the lower shear blade and being swingable across the lower shear blade for shearing a workpiece and to swing into the space between the shear and guide blades of the lower jaw,

and the guide blade having a top supporting edge spaced below the shearing edge of the insert bar on the lower shear blade by a distance at least as great as the approximate space between said shearing edge and said supporting seat whereby to be normally spaced below the workpiece on the shear blade and to receive and support the workpiece after a length of the workpiece is severed by the shear blades.

4,558,516

POSITIVE LOCK AND QUICK RELEASE KNIFE AND SHEATH

Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Portland, Oreg.

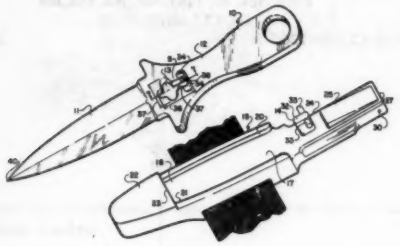
Filed Feb. 29, 1984, Ser. No. 584,625

Int. Cl.⁴ B26B *29/02*

U.S. Cl. 30—151 **4 Claims**

4. A positive lock mechanism for retaining the blade of a knife in a rigid sheath having an extension juxtaposed to a portion of the handle when the knife is seated in the sheath, said positive lock mechanism comprising an abutment extend-

ing laterally from the surface of the sheath extension proximal to the handle, an opening through the handle, the abutment extending through the opening and outwardly beyond the handle, said abutment including a transverse portion fixed in spaced parallel relation to the handle and extending across a part of the handle when the knife is fully seated in the sheath,



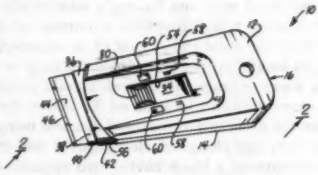
means urging the handle into engagement with the abutment to limit movement of the knife relative to the sheath, said part of the handle engageable with the said transverse part of the abutment having a recess corresponding to the shape of said transverse portion of the abutment for seating engagement therewith, and the opposite surface of the handle having a second recess corresponding to said first recess.

4,558,517

SCRAPER HAND TOOL

Donald Gringer, Bishop Rd., Bedford, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,439
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—169 **14 Claims**



1. An improved scraper hand tool for use with a blade having a cutting edge, comprising:

an elongated hollow casing having an elongated slot axially defined in one wall thereof and an open mouth at the forward end of the casing;

an integral operating member of resilient material disposed for axial movement within said casing and comprising an axially elongated body clamp means on the forward end of said body for releasably receiving a blade, a thumb-controlled actuating portion disposed substantially centrally along said body, and a pair of arms extending laterally outward from and beyond the elongated body at said actuating portion;

the axially forward and rearward ends of said body, and said actuating portion and lateral arms, being biased in respectively opposite directions toward opposite interior walls of the hollow casing in a full beam suspension arrangement in which both of said ends of said body are supported, and said lateral arms are urged into positive engagement with said opposite interior walls and said actuating portion is urged into projecting relation through said casing slot for manipulative access by a user's thumb in effecting selective axial movement of said operating member;

said operating member being axially movable in a channel in one of said interior walls between a first position in which a blade carried by said clamp means is protectively disposed fully within said hollow casing, and a second position in which the blade is maintained in operative position with its cutting edge projecting from said casing; and

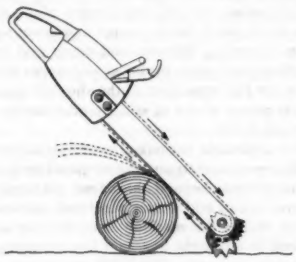
lateral lock means for each of said lateral arms for releasably securing said full beam suspension operating member in said second position, each of said lateral lock means comprising detent means cooperative with an opening for releasably locking said lateral arms to said interior casing wall in a positive engagement, said opening and detent means being automatically engaged as said full beam suspension operating member is moved to said second position and being disengagable through inwardly directed thumb-applied force on said actuating portion to thereby urge said lateral arms out of said positive engagement with said interior casing wall and enable axial movement of said full beam suspension operating member from said second position while enabling said full beam suspension arrangement to be maintained; whereby substantial rigidity may be maintained throughout said axial movement.

4,558,518

TIP STABILIZING DEVICE FOR A CHAIN SAW

Vincent D. Morabit, 1230 Wendy Rd., Rock Hill, S.C. 29730

Filed Dec. 30, 1982, Ser. No. 454,641
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—371 **26 Claims**



1. In a portable power chain saw of the straight guide bar type having a guide bar with substantially straight sides and a chain traveling around the guide bar to cut wood or other material on said substantially straight sides of said guide bar, a tip device for attachment to the guide bar for improving the operation and safety of said chain saw, said tip device comprising:

a substantially flat plate rigidly attached to the forward end of the guide bar; and

tip stabilizing means connected to said plate and responsive to the forces produced between said chain and the wood or other material being cut for engaging a fixed surface other than the wood or other material being cut and which is located at the forward end of said guide bar to stabilize the operation of said chain saw, said tip stabilizing means having at least one spike extending outwardly past the rounded end of the guide bar to engage the fixed surface in response to the forces between said chain and the wood or other material being cut during operation of said chain saw.

4,558,519

WORKING DEVICE FOR DRESS PATTERNS IN THE FORM OF A TEMPLATE

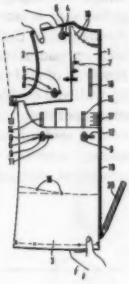
Fred Werber, No. 26a Rahlstedter Bahnhofstrasse, 2000 Hamburg 73, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,864

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237890

Int. Cl.[4] A41H *3/015*

U.S. Cl. 33—14 8 Claims



1. A dress pattern template for transferring a pattern onto paper or fabric in the production of bodice parts of garments, said template comprising:

(a) a longitudinally extending master panel, having upper and lower sides and lateral sides extending between said upper and lower sides, including first guide means at one of said lateral sides for marking lines for a portion of the center seams and second guide means at said upper side adjacent said one lateral side for marking lines for the necklines and the adjacent portion of the shoulder seams;

(b) an upper panel, having upper and lower sides and lateral sides extending between said upper and lower sides, including third guide means at said upper side for marking lines for the remainder of the shoulder seams and fourth guide means at one of said lateral sides for marking lines for arm holes;

(c) first adjustable mounting means for adjustably securing said upper panel to said master panel such that said upper panel extends beyond the lateral side opposite said one lateral side of said master panel and said second and third guide means for marking lines for the shoulder seams extend in a straight line, said first mounting means being arranged to guide adjustable movement of said upper panel along a path transverse to the longitudinal axis of said master panel and substantially parallel to said second and third guide means for marking lines for the shoulder seams such that said second and third guide means are maintained in a straight line;

(d) a lower panel, having upper and lower sides and lateral sides extending between said upper and lower sides, including fifth guide means at one lateral side for marking lines for the remainder of the center seams, a sixth guide means at the other lateral side opposite said one lateral side for marking lines for the side seams, and seventh guide means at said lower side for marking the hem;

(e) second adjustable means for adjustably securing said lower panel to said master panel such that said lower panel extends beyond said lower side of said master panel, said fifth guide means is substantially parallel to said first guide means, and at least a portion of the upper side of said lower panel overlaps said lower side of said upper panel, said second mounting means being arranged to guide adjustable movement of said lower panel along both paths substantially parallel to the longitudinal axis of said master panel and paths transverse to the longitudinal axis of said master panel.

4,558,520

SELF-WIPING UNIVERSAL LIQUID LEVEL GAUGE

George S. Forde, Jr., 8401 Seminole Ave., Philadelphia, Pa. 19118

Filed Nov. 30, 1983, Ser. No. 556,264

Int. Cl.[4] G01F *23/04*

U.S. Cl. 33—126.7 R 1 Claim

1. A gauge for measuring liquid levels in a liquid container such as a fuel tank comprising an elongated element having proximal and distal ends and having a substantially uniform transverse cross-section throughout a portion of its length extending from the distal end at least to an intermediate position along its length, at least one visible marking on said portion, and a wiper, arranged to slide along said portion of the elongated element, from a location on the side of the marking remote from the distal end to the distal end, and being slidably removable from said elongated element over said distal end, the wiper comprising a block having two opposite ends and having an internal passage extending from one of said opposite ends to the other, at least a portion of the passage having rigid walls conforming to the cross-sectional shape of said portion of the length of the elongated element, and the end of the internal passage of the wiper which is nearest to the distal end of the elongated element when the elongated element extends through the passage, being in the form of a series of stepped coaxial cylinders all of which are substantially coaxial with and larger than, said portion of the passage having rigid walls conforming to the cross-sectional shape of said portion of the length of the elongated element.

4,558,521

MECHANISM FOR CHECKING THREE-DIMENSIONAL BODIES

George L. Steck, Dayton; Raymond E. Steck, Miamisburg, and Laurence D. Steck, Dayton, all of Ohio, assignors to Steck Manufacturing Co., Inc., Dayton, Ohio

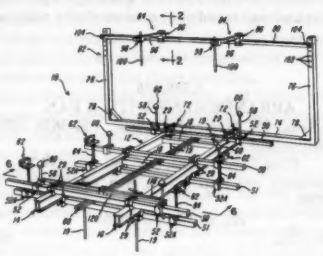
Filed May 3, 1984, Ser. No. 606,665

Int. Cl.[4] E04F *21/26*

U.S. Cl. 33—533 17 Claims

1. A vehicle checking mechanism comprising a pair of beams supported in spaced apart and parallel relationship by means of transverse girders welded therebetween, a plurality of spreadable crossing clamps removably attached to said beams, a plurality of upper crossbars spanning said beams, and each

received by a pair of said crossing clamps, one on each of said beams, each said crossbar slidably engaged by a mounting



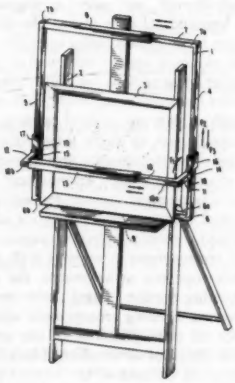
bracket, and a reference pointer mounted to each of said mounting brackets.

4,558,522

HAND GUIDE FOR PAINTERS OR DRAFTSMEN

Marcel Lance, 100 route de la Badine, 06160 Juan Les Pins, France

Filed Feb. 7, 1984, Ser. No. 577,745
Claims priority, application France, Feb. 7, 1983, 83 02011
Int. Cl.[4] A47B *97/04*
U.S. Cl. 33—443 4 Claims



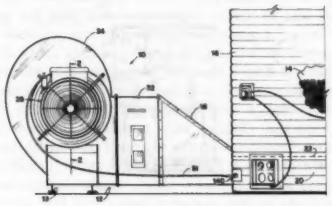
1. Removable hand guide for painters or draftsmen adapted to be secured to an easel, said hand guide comprising a frame constituted by an upper crosspiece, a lower crosspiece and two uprights and at least one horizontal bearing bar slightly mounted on said uprights, at least said upper crosspiece and said lower crosspiece each being comprised by two separate partial crosspiece slidably interconnected so as to allow the adjustment of at least the width of the frame to the dimensions of a panel to be painted, said horizontal bearing bar being adjustable as to length and comprising two legs each of which is provided at its free end with locking means for locking said bearing bar along said uprights and each of which legs is secured by means of hinges to a sliding member slidably mounted on said uprights.

4,558,523

METHOD AND APPARATUS FOR EQUILIBRIUM DRYING OF GRAIN

Benny R. Isbell, P.O. Box 195, Humnoke, Ark. 72072, and Joel T. Hicks, Little Rock, Ark., assignors to Benny R. Isbell, Humnoke, Ark.

Filed Oct. 5, 1984, Ser. No. 658,280
Int. Cl.[4] F26B *3/02*
U.S. Cl. 34—30 5 Claims



1. A method for drying grain stored in a conventional storage bin or the like to a predetermined desired moisture quality by inputting air into the bin through a lower air admission plenum and thereafter circulating air through the bin, the method comprising the steps of:

(a) ascertaining a control depression by calculating the differences between an expected overnight low temperature of ambient air and the temperature measured at local sunset;

(b) continuously circulating air through said bin by inputting outside ambient air into said plenum and forcing it through said grain and out of said bin;

(c) ascertaining a control relative humidity by determining that drying air relative humidity necessary for reaching said desired grain moisture quality for circulating drying air of a dry bulb temperature approximately equal to said expected overnight low temperature of ambient air plus said previously ascertained control depression;

(d) selectively heating air entering said plenum with a low energy heat source whereby to raise dry bulb plenum temperature to a temperature value approximately no more than the dry bulb temperature of ambient air plus said control depression; and,

(e) initiating said selective heating step when ambient air relative humidity becomes approximately equal to said control relative humidity.

4,558,524

SINGLE VAPOR SYSTEM FOR SOLDERING, FUSING OR BRAZING

Douglas J. Peck, North Andover, and Donald J. Spigarelli, Carlisle, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Oct. 12, 1982, Ser. No. 433,662
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—78 19 Claims

1. A single vapor system for soldering, fusing or brazing comprising:

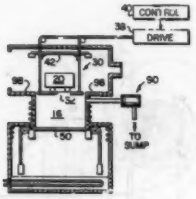
at least two vertically disposed chambers, the first of said chambers being a draining and drying zone having a top and a bottom, the second of said chambers being a single vapor processing zone disposed below said first zone;

article-carrying means having a bottom adapted to move vertically into and out of said zones;

means for lowering said article-carrying means through said first zone and into said second zone, and for withdrawing said article-carrying means from both zones; and

sealing means operative in response to lowering and withdrawing of said article-carrying means and including a vertically moveable top cover having spacer means for

supporting said top cover at least a fixed predetermined distance above the bottom of said article-carrying means, said top cover being adapted to be left at the top of said first zone to seal the top of said first zone in response to the lowering of said article-carrying means toward the bottom of said first zone; a vertically moveable bottom plate; means for biasing said vertically moveable bottom plate to seal the bottom of said first zone when the bottom of said article-carrying means is above the bottom of said first



zone; the biasing force of said biasing means being less than that exerted by said article-carrying means so that when said article-carrying means is lowered through the bottom of said first zone said cover seals the top of said first zone and said bottom of said article-carrying means abuts the moveable bottom plate which is moved downwardly to unseal the bottom of said first zone in response to the lowering of said article-carrying means through said first zone toward said second zone.

4,558,525

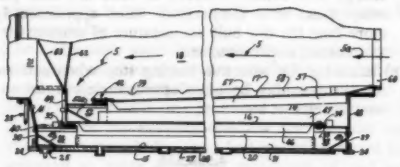
DEHYDRATION EQUIPMENT

Wilfried P. Duske, Milwaukee, and Lowell C. Frank, Okauchee, both of Wis., assignors to Progressive Development Incorporated, Milwaukee, Wis.

Continuation of Ser. No. 53,973, Jul. 2, 1979, abandoned. This application Dec. 30, 1980, Ser. No. 221,433

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—128 **15 Claims**



3. A concurrent flow rotating dryer apparatus including a plurality of at least three generally cylindrical members mounted concentrically and in axial alignment adjacent each other on a common axis of rotation and defining a series of interconnected axial passageways including a central passageway means, means for introducing a heated particle laden fluid under pressure into an inlet end of said central passageway means and thereby establishing a particle laden fluid stream passing from said inlet end axially back and forth through said series of axial passageways to an outermost passageway means, means for exiting said fluid from said outermost passageway means, the innermost cylindrical member defining said central passageway means and being spaced radially inwardly of the adjacent cylindrical member, said innermost cylindrical member having a substantially tapered configuration defining a relatively small diameter open end at said inlet end to receive the heated particle laden fluid stream and increasing progressively from said inlet end throughout the length of the innermost cylindrical member and moving said stream through an increasing diameter in said central passageway means to a relatively large diameter discharge end whereby said particle laden fluid enters the inlet end at a substantially higher velocity than at the exit end and said fluid carries said particles therewith with a progressively decreasing velocity and the particle laden fluid exits from the opposite discharge open end of the innermost cylindrical member at a substantially reduced velocity.

4,558,526

ARRANGEMENT WITH A FAN

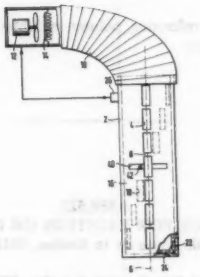
Heinz G. Baus, 35, Wartbodenstrasse, CH-3626 Hünibach/-Thun, Switzerland

Filed Feb. 8, 1984, Ser. No. 578,114

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304559

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—232 **16 Claims**



1. A forced air flow device comprising: an elongated air flow duct having a longitudinal axis and formed with an outlet opening arrangement comprising at least one air outlet opening through the wall thereof, said outlet arrangement extending parallel to said longitudinal axis; means blowing air into said duct for discharge through said outlet opening arrangement; a control member mounted against said wall of said duct adjacent said air outlet arrangement for controlling egress of air through said outlet opening arrangement, said control member being formed with at least one control opening disposed in an arrangement extending at an angle longitudinally and transversely across said air outlet opening arrangement, the longitudinal position along said outlet arrangement at which the control opening arrangement crosses depending on the position of said control member; and means for causing relative displacement of said control member to cause a portion of said control opening arrangement to register with a selected portion of said outlet opening arrangement, the cross-sectional area of the registering portion of said outlet opening arrangement and said control opening arrangement being substantially the same size for all open postiions of the control member whereby to allow egress of air at selected locations along said duct depending on the position of the control member and at essentially constant strength.

4,558,527

READING AID APPARATUS, ESPECIALLY A COPYHOLDER FOR TYPEWRITERS

Helmut Schroedel, and Nancy Nugent, both of 726 N. Beach Rd., Gwelup W. A., Australia

Continuation of Ser. No. 442,268, Nov. 17, 1982, abandoned. This application Feb. 6, 1985, Ser. No. 699,216

Claims priority, application Australia, Apr. 27, 1982, PF3738; May 5, 1982, PF3892; Fed. Rep. of Germany, Jul. 13, 1982, 8220020[U]

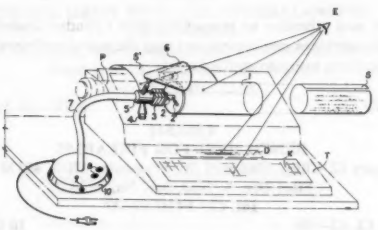
Int. Cl.[4] B41J *11/36, 13/00*

U.S. Cl. 40—343 **7 Claims**

1. In an apparatus for holding a sheet containing information to be transcribed by a keyboard, the improvement comprising:

(a) a rotatable hollow cylinder having a longitudinal rotational axis, said hollow cylinder being made of transparent material for holding a sheet rolled up inside said hollow cylinder, said hollow cylinder having two open ends each with an unobstructed open surface for inserting said sheet into said hollow cylinder through either end without any interference with the sheet insertion,

(b) means for rotatably supporting said hollow cylinder, said means for supporting comprising two forked members, each forked member having two elastically yielding curved arms to form a cradle type structure for rotatably holding said hollow cylinder on its outer surface substantially adjacent its open ends and leaving both said open ends unobstructed, said curved arms encircling said hollow cylinder only partially and being sufficiently flexible for permitting an easy insertion and withdrawal of said hollow cylinder substantially perpendicularly to and also lengthwise of said longitudinal rotational axis into and out of said cradle type structure without any tools,



(c) said means for supporting further comprising a substantially round member extending in parallel to said rotational axis of said hollow cylinder, said substantially round member rigidly interconnecting said two forked members, clamping means partially encircling said substantially round member, and means secured to said clamping means for carrying said hollow cylinder through said clamping means,

(d) and wherein said clamping means is made of relatively elastic material to function as a clamp for said substantially round member to provide a location clamp fit between said substantially round member and said clamping means, whereby said cradle type structure with the hollow cylinder held therein is adjustable in its position up and down, along a curve having its center in said substantially round member and back and forth along said substantially round member.

4,558,528

OPENABLE PACKAGE FOR A CONSUMER PRODUCT SUCH AS CHILD'S MEAL, WITH A BUILT-IN 3-D VIEWER FEATURE SIMULATING A THEATER

William D. Cunningham, Rocky Mount, N.C., assignor to Hardee's Food Systems, Inc., Rocky Mount, N.C.

Filed Mar. 14, 1983, Ser. No. 475,374
Int. Cl.[4] G02B *27/04*
U.S. Cl. 40—365 **8 Claims**

1. An openable package for a consumer product, with a built-in 3-D viewer, comprising:

folding, erectable wall means defining a package including a bottom wall, a top wall, and two pairs of generally upright opposed sidewalls, said package enclosing an interior space;

said top wall including two roof panels which, when said package is in a closed condition, rise obliquely from respective upper marginal edges of said sidewalls of one of said pairs of generally upright opposed sidewalls to a center ridge;

upstanding, slotted handle means provided on each said roof panel at said center ridge;

closure means releasably interconnecting said handle means so as to openably, reclosably maintain said package in said closed condition and provide access to said interior space;

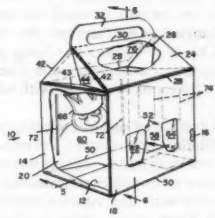
said wall means including gable means which, when said package is in said closed condition, extend from respective upper marginal edges of said sidewalls of the other of said pairs of generally upright opposed sidewalls to bridge between such upper marginal edges and said roof panels and thus contributing to enclosing said interior space;

viewing aperture means provided in one of said sidewalls, said viewing aperture means including a region through which a user's left eye may look into the interior space and a laterally adjacent region through which the user's right eye simultaneously may look into the interior space;

the left eye region being glazed with a light-transmitting sheet material having a first visually apparent optical characteristic and the right eye being glazed with a light-transmitting sheet material having a second visually apparent optical characteristic which is substantially different from said first visual apparent optical characteristic;

the respective sidewall opposed to said one sidewall having an interior side providing a viewing screen; and

means providing a set of 3-D graphics including at least one scene presented in two substantially superimposed views which are slightly out of registry, along a lateral axis, with the left-most said view being printed in a medium constructed and arranged to be predominantly viewed only through the left eye region and the right-most said view



being printed in a medium constructed and arranged to be predominantly viewed only through the right eye region;

said graphics providing means being constructed and arranged to be superimposed upon said screen for 3-D viewing through said viewing aperture means;

at least some of said graphics providing means being constituted by printing upon an opaque strip; said respective opposite sidewall of said package which interiorly provides said screen having means defining a pair of parallel slits therethrough which are laterally spaced relative to one another; said strip being insertable through one of said slits and out through the other of said slits in order to superimpose said graphics providing means on said screen;

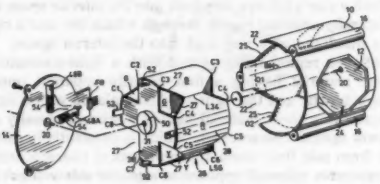
aperture means defining a skylight in said one of said roof panels top wall for front-illuminating said graphics providing means within said interior space said aperture means being laterally bounded at the left and right by material of said one roof panel;

said wall means including a portion of said one roof panel of said top wall for at least temporarily closing said aperture so that said interior space may be substantially enclosed by said wall means for packaging at least one consumer article, which, upon removal exposes said viewing screen to said viewing aperture means;

said roof panel portion being constructed and arranged to be at least temporarily removed while said closure means remains releasably interconnected so that said set of 3-D graphics may be observed in a front-illuminating condition through said viewing aperture while said roof panel

portion is at least temporarily removed but said closure means continues to maintain said roof panels otherwise closed.

4,558,529
DISPLAY ELEMENT WITH BACK LIGHTING
Kwangling Chang, Toronto, and Pankaj J. Dave, Concord, both of Canada, assignors to NEI Canada Limited, Toronto, Canada
Filed Feb. 4, 1985, Ser. No. 698,347
Int. Cl.[4] G09F *11/02*
U.S. Cl. 40—473 **6 Claims**

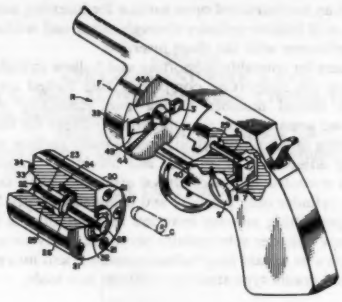


1. Display or indicator device, defining a forward viewing direction and comprising a rotor and a stator:
said rotor being cylindrical,
said rotor being mounted to rotate about an axis approximately perpendicular to said viewing direction,
means for controlling the position of said rotor to cause it to assume a selected one of at least three rotary positions,
said stator providing an enclosure for said rotor having a viewing aperture on said forward side and,
at least one illumination aperture on said rearward side,
the cylindrical surface of said rotor being provided with at least two translucent areas adapted in a corresponding one of said rotary positions to register with said viewing aperture,
the cylindrical surface of said rotor being provided with at least one illumination aperture corresponding to each translucent area designed to register with said stator illumination aperture when the corresponding translucent area is in registration with said viewing aperture,
said rotor and stator illumination apertures being so arranged that such rotor apertures do not register with said viewing aperture in any such corresponding rotary positions.

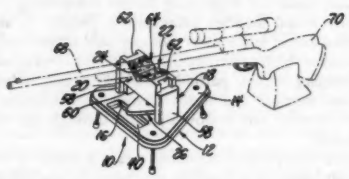
4,558,530
SNAP IN CYLINDERS FOR REVOLVERS
Clinton J. de Witt, 610 Laurel Dr., Sacramento, Calif. 95825
Continuation-in-part of Ser. No. 525,673, Aug. 23, 1983. This application Jul. 25, 1984, Ser. No. 634,481
Int. Cl.[4] F41C *1/00*
U.S. Cl. 42—59 **14 Claims**

1. In a revolver having a removable cylinder, the combination of a revolver frame having at least one guide channel formed therein laterally thereof, the guide channel having an opening formed therein, an inclined ramp projecting through the opening in the guide channel, a tapered centering pin connected to the ramp for movement in unison in a direction longitudinally of the revolver frame, and resilient means biasing the centering pin and ramp longitudinally of the frame.

2. In a revolver adapted for shooting at a target, the combination of a revolver frame, a cylinder completely removable from the frame, a plurality of cartridges within the cylinder, resilient means for maintaining the cartridges within the cylinder, whereby the cylinder can be held in any orientation without the cartridges falling out of the cylinder, guide means formed within the revolver frame, whereby the cylinder can be guided within the frame, resiliently-biased retention means in the frame, whereby the cylinder can be snapped into the frame, ejection means in the revolver frame for selectively disabling the retention means, and resilient means for ejecting the cylinder, whereby the cylinder can be forcibly ejected completely out of the revolver frame and completely disassociated therefrom, and whereby an interchangeable cylinder loaded with fresh cartridges can be snapped into the revolver frame without looking away from the target.



4,558,531
BENCH REST FOR FIREARMS
Gregory G. Kilby, 9068 Ball St., Plymouth, Mich. 48170
Filed Dec. 5, 1983, Ser. No. 557,828
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 **10 Claims**

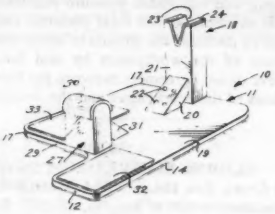


1. A weapon bench rest (10) comprising: a base (12) having top (14) and bottom (16) sides; a pair of spaced upright guide means (18) extending upwardly from the top side (14) of said base (12); a bridge (20) extending between said guide means (18) parallel to said top side (14) presenting a weapon support surface (22) at the top (24) thereof; height adjustment means (26) for incrementally adjusting the distance between said weapon support surface (22) of said bridge (20) and said base (12); a plurality of detachable legs (42) extending outwardly from said bottom side (16) of said base (12) for supporting said base, said base (12) having a generally triangular configuration; and a handle (40) formed by an opening in said base (12).

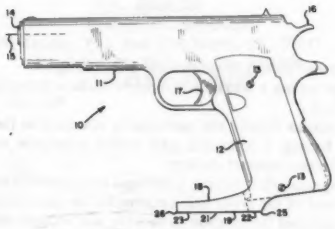
4,558,532
RIFLE BENCHREST
Monte S. Wright, 445 Hedionda Ct., San Diego, Calif. 92117
Filed Jan. 3, 1984, Ser. No. 567,812
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 **1 Claim**

1. A rifle benchrest, comprising, in combination, a horizontal, flat base, a rearward extension of one side portion of said base, a soft non-slip pad upon said extension and another soft non-slip pad upon a rear end of an opposite side portion of said base, an upright, front support post and an upright, rear support post mounted upon said base, a "V"-shaped notch upon an

upper end of said front support post, a soft non-slip pad lining said "V"-shaped notch, and an upper end of said rear support post being rounded with a semicylindrical, transverse extending surface covered by another soft non-slip pad.



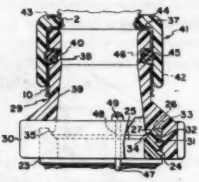
4,558,533
PISTOL GRIPS WITH COUNTERBALANCING PLATFORMS
Gerald W. Seliga, 324 Greenfield La., Frankfort, Ill. 60423
Filed Feb. 28, 1984, Ser. No. 584,518
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—71 P **18 Claims**



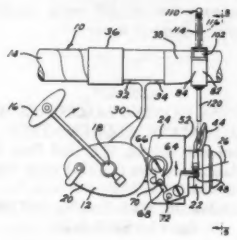
1. A pistol grip for use with a pistol having a barrel with a predetermined line of flight of a bullet and said pistol having a predetermined center of gravity, including:
   a grip which is affixed to said pistol;
   a platform extending from said grip; and
   a support portion of said platform extending away from said grip in a length allowing a user to exert a force which would cause the line of flight of a bullet to lower and having at least one point of said support portion of said platform on a vertical line passing through said center of gravity when said line of flight of a bullet is raised 5° from horizontal.

4,558,534
PLANKTON SAMPLE TAKING APPARATUS
William H. Phillips, Saginaw, Mich., assignor to Holgate Corporation, Saginaw, Mich.
Filed Aug. 5, 1983, Ser. No. 520,567
Int. Cl.[4] A01K *73/00*
U.S. Cl. 43—9 **10 Claims**

5. In sample taking apparatus having a container at one end of which is an externally threaded open mouth, a gathering device having a pliable cod at one end, an annular body member having a first section thereof fitted into said cod and a second section terminating in an internally threaded skirt threadedly accommodating the mouth of said container, an annular anchor member encircling said first section of said body member and that part of said cod thereon, and a retaining ring interposed between said first section of said body member and said part of said cod for retaining said first portion of said body member within said cod, the improvement comprising an annular, radially inwardly extending flange at one end of said anchor member overlying and bearing upon the corresponding end of said first portion of said body member with said cod sandwiched between said flanged and said end of said body member, said end of said body member being smoothly rounded and said flange having a smoothly arcuate convex outer surface.



4,558,535
THUMB-OPERATED TOUCH ROD FOR SPINNING REEL
Vernon F. Eldridge, 465 Chicopee Ave., Louisville, Ky. 40209
Filed Aug. 2, 1984, Ser. No. 636,953
Int. Cl.[4] A01K *89/00*
U.S. Cl. 43—25 **3 Claims**



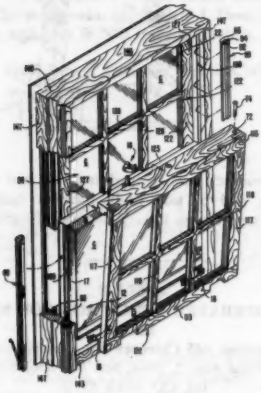
1. In combination with an open-face spinning reel having a line pickup bail, all supported beneath the handle of a casting rod, the invention comprising:
   a. a first clamping member adapted to be fastened adjacent the front end of the rod handle;
   b. a vertically movable thumb-operated bar having guide means supported from the clamping member, spring means acting between the clamping member and said thumb bar for urging the thumb bar normally into a raised position above the clamping member;
   c. the guide means extending downwardly below the clamping member and carrying a touch rod for making engagement with and depressing the said line pickup bail when both the reel is operated to retrieve the line and the thumb bar is depressed simultaneously;
   d. whereby the bail automatically springs open for instant casting when the thumb bar is released and the touch rod releases the bail.

4,558,536
WINDOW CONSTRUCTION
Forrest L. Dunsmoor, Atlanta, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.
Filed May 9, 1984, Ser. No. 608,417
Int. Cl.[4] E05D *15/16*
U.S. Cl. 49—404 **24 Claims**

1. A window construction comprising:
   a combination wood/metal frame mountable in the framework of a building;

a metal double hung window being removably mounted in said wood/metal frame by insulating mounting strips; and

a wood liner/fascia attachable to said metal window to give



the appearance thereto of a wood window and which also prevents removal of said insulating mounting strips to prevent disassociation of said metal window from said combination wood/metal frame.

4,558,537

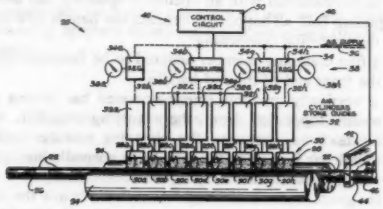
CENTERLESS HONING MACHINES HAVING AUTOMATIC SIZE CONTROL

Roderick B. MacLeod, Bristol, R.I., and Paul J. Mandeville, Blackstone, Mass., assignors to Taft-Peirce Supfina Machine Company, Inc., New York, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,769

Int. Cl.[4] B24B *5/04*

U.S. Cl. 51—66 **12 Claims**



1. A centerless honing machine for honing predetermined external generally cylindrical surfaces on a series or workpieces, said honing machine comprising

a pair of spaced adjacent rotary roller means for supporting and rotating the workpieces while also causing the workpieces to travel axially along said roller means,

at least one honing element for engaging and honing said predetermined external generally cylindrical surfaces of the successive workpieces as they travel axially along said roller means,

pressing means operable by fluid pressure for pressing said honing element against said surfaces of the workpieces,

gaging means for gaging the size of the predetermined external generally cylindrical surfaces on the workpieces and for producing signals indicating the relationship between the size of said surfaces of the workpieces and the desired size,

adjustable pressure regulating means for supplying adjustable fluid pressure to said pressing means,

and control means operable in response to said signals for ajusting said adjustable pressure regulating means to increase or decrease the fluid pressure and thereby to increase or decrease the amount of stock removed from said surfaces of the workpieces by said honing element to achieve closer agreement between the finished size of said surfaces of the workpieces and the desired size.

4,558,538

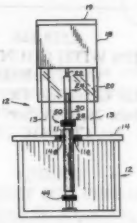
SLIDING SLEEVE DRUM SANDER

Laurence Green, Box 156, Gildford, Mont. 59525

Continuation-in-part of Ser. No. 352,957, Feb. 26, 1982, abandoned. This application Feb. 25, 1983, Ser. No. 469,635

Int. Cl.[4] B24B *7/08*

U.S. Cl. 51—72 R **9 Claims**



1. A power driven drum sander, comprising:

a frame having a workpiece support surface forming a part thereof;

motor means rigidly and stationarily attached to the frame and having a rotational axis which intersects with the workpiece support surface;

an elongated arbor having a first end and a second end; said first end of the arbor being connected to the motor means and adapted for rotation therewith; said second end of the arbor being rotatably supported by the frame; said arbor having a slidable regin upon exterior surfaces thereof, said slidable region having a noncircular cross-sectional shape;

a cylindrical sleeve positioned coaxially upon the arbor along said slidable region;

releasable adjustable securement means for allowing the sleeve to be adjustably positioned axially along the arbor and for securely holding the sleeve at a fixed axial position upon the arbor; said securement means having a tapered threaded region formed upon an end of said sleeve, nut means threadably received upon threaded region, and at least one slot means cutting through the peripheral wall of the threaded region to allow the threaded region of the sleeve to contract against the arbor as the nut means is tightened onto the tapered threaded region of the sleeve; and

abrasive material secured to the cylindrical sleeve about its outer cylindrical surface.

4,558,539

PNEUMATIC ROTARY GRINDING TOOL

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 22, 1984, Ser. No. 623,387

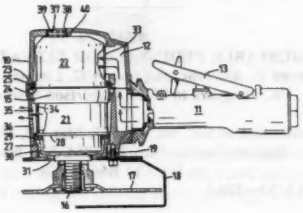
Claims priority, application Sweden, Jun. 27, 1983, 8303653

Int. Cl.[4] B24B *23/00, 55/04*

U.S. Cl. 51—170 R **7 Claims**

1. A pneumatic rotary grinding tool comprising a housing **(10)**, a motor unit **(15)** mounted in said housing **(10)** and driving an output spindle **(16)**, a pressure air supply passage **(12)** communicating with an air inlet port means **(33)** on the motor unit **(15)**, an exhaust passage **(35)** communicating with an air outlet

port means (34) on the motor unit (15), and a safety guard (18) detachably mounted on the housing (10) in a protective disposition relative to a grinding wheel (17) attached to the output spindle (16), characterized in that a seal means (23–25) is arranged between the motor unit (15) and the housing (10) to seal off said air supply passage (12) from said exhaust passage (35),



the motor unit (15) being displaceable in the housing (10) between a rear operative position in which said seal means (23–25) is maintained in its active position and a forward dislocated position in which said seal means (23–25) is rendered inactive, said safety guard (18) being arranged to support the motor unit (15) in said rear operative position when properly mounted on the housing (10).

4,558,540

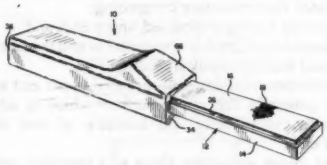
KNIFE SHARPENER

Walter W. Collins, P.O. Box 158, North, S.C. 29117

Filed Jan. 28, 1983, Ser. No. 461,994

Int. Cl.[4] B24D *15/08*

U.S. Cl. 51—214 **9 Claims**



1. A portable hand-held knife sharpener comprising:

a casing defining a handle,

a tray slidably mounted in said casing for telescoping movement between a retracted position in which said tray is housed within said casing and an extended position in which said tray extends from an open end of said casing, said tray including a tray recess defined by tray sidewalls,

a sharpening block removably mounted within said tray recess and extending upwardly above said tray sidewalls for use in sharpening a knife blade while remaining in the tray, said block including an exposed sharpening surface,

said casing encompassing the tray and block throughout substantially the full length of said tray in said retracted position to retain said block in said tray,

releasable bolt-action means cooperable with said tray and casing for extending and retracting said tray and block relative to said casing,

said bolt-action means being operable in said retracted position to lock said tray within said casing,

said bolt-action means being cooperable with said tray and casing in said extended position to lock said tray in said extended position,

said tray including a tray end extension extending rearwardly of said tray recess,

said bolt-action means including a plunger chamber within said tray end extension and spring-biased plunger means extending through a slot in a wall of said casing and into said chamber for selectively locking said tray in and releasing said tray from said extended and retracted positions,

said casing including an elevated upper front end portion including an inclined planar surface sloping downward nd forward toward said sharpening surface at an angle to said sharpening surface when said tray is extended such that said inclined surface provides a sharpening guide for positioning said blade at a desired sharpening angle with respect to said sharpening surface.

4,558,541

ICE SKATE SHARPENING METHOD

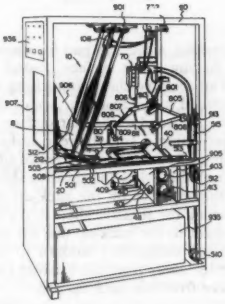
Joseph A. Consay, Calgary, Canada, assignor to Universal Skate Sharpeners Ltd., Calgary, Canada

Continuation of Ser. No. 511,621, Jul. 7, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,975

Claims priority, application Canada, Jun. 10, 1983, 430108

Int. Cl.[4] B24B *9/04*

U.S. Cl. 51—281 R **6 Claims**



1. A method of sharpening the bottom edge of the blade of an ice skate, said edge having a complexly curved, convex profile in side view, comprising the steps of

(a) rotating about a horizontal axis a thin grinding wheel having a periphery with a convex transverse cross-section corresponding to a desired concave transverse cross-section of said blade edge,

(b) placing the blade in clamping means located above the wheel and having open and closed positions, with said blade depending from said clamping means,

(c) moving a skate detector from a withdrawn position to an active position in which it is located closely below the clamping means when the latter is in a start position withdrawn from the wheel to detect said skate blade depending from the clamping means,

(d) upon detection of the skate blade by said skate detector moving a pair of stops in unison from an open position towards each other to engage end portions of the skate to center the blade longitudinally in the clamping means,

(e) moving the clamping means from its open position to its closed position to clamp the blade with the central longitudinal plane of the blade coplanar with the central plane of the wheel regardless of the transverse thickness of the blade, and

(f) pivoting the clamping means about a horizontal axis parallel to and above the axis of the wheel to move the clamping means through a sequence of grinding positions in which the blade edge is in grinding contact with the wheel, such movement effecting longitudinal movement of the blade edge relative to the wheel in an arc that is curved in the same direction as said edge profile, the wheel being biassed against the blade edge to remove a cut therefrom.

4,558,542

STICK-ON ABRASIVE DISC

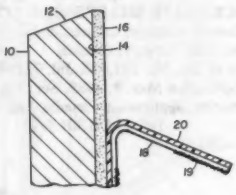
Miska Marton, 3620 Rankin Blvd., Windsor, Ontario, Canada

Continuation-in-part of Ser. No. 142,780, Apr. 22, 1980, abandoned, which is a continuation of Ser. No. 934,991, Aug. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 893,602, Apr. 3, 1978, abandoned. This application Dec. 23, 1980, Ser. No. 219,489

Claims priority, application Canada, May 5, 1978, 302741

Int. Cl.[4] B24D *9/08, 11/02*

U.S. Cl. 51—358 **3 Claims**



1. In combination, a back-up pad for a sanding machine, the back-up pad having a flat surface coated with a feathering adhesive, and an abrasive sheet comprising a paper base sheet, an abrasive bonded to the front surface of the paper sheet and a flexible coating bonded to the rear surface of the paper sheet, the coating providing a smooth rear surface of the abrasive sheet which smooth rear surface is free of adhesive, the combination being such that when the abrasive sheet is secured to the back-up pad the adhesive on the back-up pad, being the sole means for securing the abrasive sheet to the back-up pad, holds the abrasive sheet to the back-up pad for sanding operations, the coating being sufficiently smooth to allow the abrasive sheet to be peeled away from the back-up pad without removing the adhesive from the back-up pad.

4,558,543

MOVING APPARATUS FOR A PNEUMATICALLY SUPPORTED MEMBRANE STRUCTURE

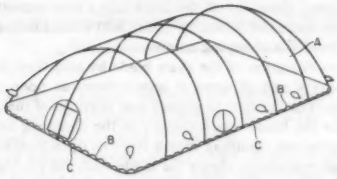
Hiroshi Kitamura, Ichikawa; Kaoru Nishikawa, and Masamitsu Naito, both of Tokyo, all of Japan, assignors to Taisei Kensetsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 479,076, Mar. 25, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 724,805

Claims priority, application Japan, Jul. 27, 1982, 57-129666

Int. Cl.[4] E04B *1/345*

U.S. Cl. 52—2 **3 Claims**



1. An apparatus for moving a pneumatically supported flexible membrane structure supported solely by pneumatic pressure within the membrane, comprising:

a rigid frame positioned only along the lower edge of substantially the entire periphery of said membrane structure and which the lower edge portion of said membrane structure is attached;

a plurality of wheeled supporting means at intervals around substantially the entire periphery of said membrane structure and having only floor engaging idler wheels and mounted on said frame and being the sole means for supporting said frame, said wheeled supporting means supporting said frame slightly above the floor or ground on which said membrane structure is positioned so that said frame can be moved across the floor or ground; and

water stopping packing means on the bottom of said frame for engaging the floor or ground when the frame is at a position on the floor or ground where the membrane structure is to be positioned.

4,558,544

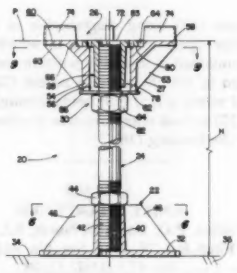
ADJUSTABLE PEDESTAL FOR ELEVATED FLOORS

Raymond E. Albrecht, and Robert G. Lindner, both of Sewickley, Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Continuation of Ser. No. 480,577, Mar. 30, 1983, abandoned. This application Nov. 29, 1984, Ser. No. 676,449

Int. Cl.[4] B66F *1/00*

U.S. Cl. 52—126.6 **20 Claims**



1. An adjustable pedestal adapted to support panel members of an elevated floor structure comprising:

a support rod having a threaded upper end; and

a head assembly adjustably connected to said threaded upper end, said head assembly including:

a head member receiving said threaded upper end and having a generally flat upper surface which is adjustable vertically, rotationally and laterally of said threaded upper end;

abutment means adjustable along said threaded upper end and engageable by said head member, establishing a position of said head member wherein said upper surface resides in a horizontal plane; and

clamping means clamping said head member to said threaded upper end.

4,558,545

FOUNDATION FOR A MAST, SUPPORTING PILLAR, AND THE LIKE

Karl B. Lindner, Torshälla, Sweden, assignor to Eskilstuna Invest AB, Eskilstuna, Sweden

Filed Nov. 19, 1982, Ser. No. 443,041

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145882

Int. Cl.[4] E02D *27/00*

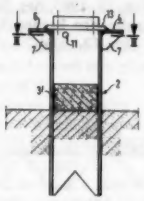
U.S. Cl. 52—169.13 **17 Claims**

1. A foundation to provide support for a structure, which foundation comprises in combination:

(a) an elongated, hollow, thin wall design section element having an upper end and a bottom end and having a free cross section at the upper end thereof and having a ground anchoring portion open at the bottom end, the ground anchoring portion driven generally vertically into the ground; and

(b) an inner ground consolidating means to consolidate the ground within the section element while the ground anchoring portion is being driven generally vertically into the ground, said means comprising a heavy weight ar-

ranged for longitudinal displacement along the ground anchoring portion of said section element whereby consolidation of the ground directly beneath said means is



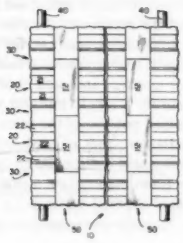
effected during the period of driving the ground anchoring portion into the ground, so that the earth resistance cone is small during the driving phase and high after the driving phase.

4,558,546

UNDERFLOOR ASSEMBLY AND CABLE DISTRIBUTION SYSTEM AND CABLE TRENCH THEREFOR

Arthur Nusbaum, Tenafly, N.J., assignor to Robert Nusbaum; Howard Nusbaum, both of New York, N.Y. and Barbara Selick, Teaneck, N.J.

Filed Jan. 20, 1983, Ser. No. 459,599
Int. Cl.[4] E04B *5/48*; H02G *3/04*
U.S. Cl. 52—221 **8 Claims**



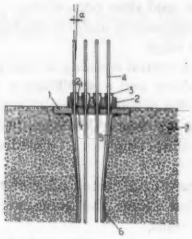
1. An underfloor assembly for a building, comprising a plurality of elongated, corrugated, metal flooring units and a plurality of elongated, metal, cable distribution ducts arranged side-by-side with said flooring units, said flooring units and said cable distribution ducts being adapted to be supported by the structural beams of the building; and a plurality of spaced-apart elongated cable trenches adapted to carry cables of different types therein and extending over and transversely across said flooring units and said cable distribution ducts, said cable distribution ducts comprising longitudinally extending base means having opposed side edges and longitudinally extending wall means on said base means and defining therewith a plurality of longitudinally extending closed cells having top, opposed side and bottom portions, a said closed cell being provided at each side edge of said base means, said wall means being interrupted at intersections of said trenches and said cable distribution ducts such that a said closed cell at said side edge has its top portion and the side portion thereof, adjacent said side edge, omitted where said closed cell at said side edge runs under said trench; said trenches comprising an open, longitudinally extending, U-shaped base pan means having a bottom portion and opposed side portions, and cover means removably secured to and closing said open U-shaped base pan means, said bottom portion of said base pan means having apertures therein at said intersections of said trenches and said distribution ducts for permitting direct access from said trench to the distribution duct below.

4,558,547

ANCHORING DEVICE FOR A PRE-STRESS CABLE

Jean-Francois A. Nieto, Rio de Janiero, Brazil, assignor to Freyssinet International (STUP) S.A., Boulogne-Billancourt, France

Filed Apr. 20, 1984, Ser. No. 602,464
Claims priority, application Brazil, Apr. 22, 1983, 8302084
Int. Cl.[4] E04C *5/08*
U.S. Cl. 52—223 L **7 Claims**



1. An anchoring device for a pre-stress cable that is formed of several filaments or strands, the device comprising

a bearing plate having a transverse dimension;

a block resting on said bearing plate but which is a separate element from said bearing plate and having a transverse dimension that is less than the transverse dimension of said bearing plate, said block having a plurality of truncated cone shaped holes therethrough through which passes a filament or strand of a cable, said plate having corresponding holes therethrough to said holes in said block, said plate holes extending axially the conical shape of said block holes such that the conical shape of the combined axially oriented holes is extended beyond said block at least into said plate, and said plate supporting said block over the non-pierced surface thereof; and

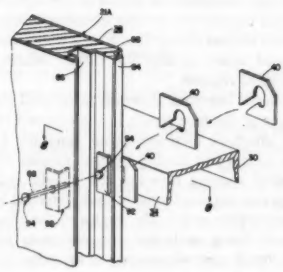
a plurality of truncated cone shaped jaws individual to said combined plate and block holes for jamming the filaments or strands into said combined holes, each said jaw extending axially beyond said block into the plate hole corresponding thereto.

4,558,548

NON-DISPLACEABLE SHIM

Richard A. Hieger, Centerville, Ind., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Nov. 16, 1983, Ser. No. 552,416
Int. Cl.[4] F16B *43/00*
U.S. Cl. 52—235 **8 Claims**



1. A wall structure comprising vertically spaced-apart horizontal frame members having outboard faces defining a work-

ing plane, at least a first frame member having the outboard face thereof inset from said working plane, first and second panel members spanning across said frame members, a joint between said panel members, fastening means pentrating the first panel at said joint and securing the same to said frame members, connecting means connecting the second panel to the first panel, and at least one shim interposed between the first panel and said first frame member to support said first panel member with the inner face thereof substantially at said working plane, said shim comprising:

a plate of substantially uniform thickness, said plate having a perimeter edge;

an elongated central opening in said plate including a large upper portion and a small lower portion, said fastener engaging the periphery of said large upper portion; and

a slot in said plate having an exit end communicating with said central opening and an entrance end at said perimeter edge;

said plate having a center of gravity within said central opening but below the geometric center of said large upper portions;

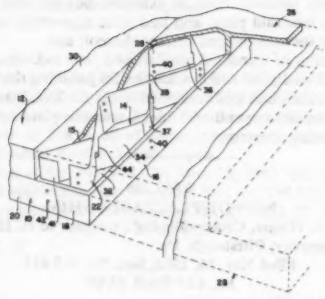
whereby said shim hangs from said fastener under the influence of its weight with the small lower portion and said slot disposed below the level of said fastener.

4,558,549

WALL CONSTRUCTION PREFABRICATED FROM INTERCONNECTABLE MODULES

Jacques L. See, 3612 Malibu Vista Dr., Malibu, Calif. 90265

Filed Apr. 19, 1984, Ser. No. 602,142
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—220 **16 Claims**



1. A modular wall construction in which half thickness modules are assembled in facing but off-set relation and positioned and coupled by joinder elements comprising:

first and second planar face panels to be coupled together in spaced apart parallel but off-set relation with exposed marginal regions;

sheet metal interlock elements positioned along at least two edges of the face panels in the exposed marginal regions, the interlock elements being generally perpendicular to the panels and having heights greater than one-half the desired spacing between the panels, and forming more than one diagonal length, each diagonal length having an intermediate notch, the angles of the diagonals of facing panels being such that the diagonals intersect and the notches frictionally engage to the other interlock element, and the interlock elements on a marginal region on a face panel being positioned such that the notch can be entered from the direction of the other face panel; and

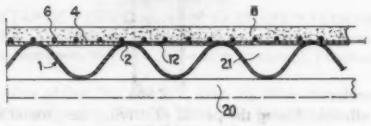
means coupling the interlock elements to the panels.

4,558,550

INSULATING AND FLUIDTIGHT ROOF COVERING

Jean Marchais, Rennes, and Michel Netter, Paris, both of France, assignors to SMAC Acieroid, Paris, France

Filed Aug. 29, 1983, Ser. No. 527,364
Claims priority, application France, Sep. 7, 1982, 82 15184
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—309.7 **21 Claims**



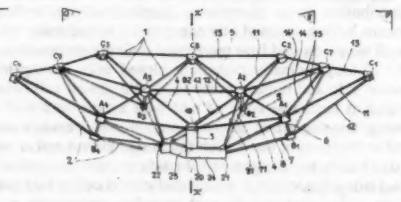
1. An insulating and fluidtight roof covering for constructing on the site, said covering comprising in combination, a support structure defining spaced-apart lines of projecting support surfaces and hollows between said support surfaces, a substantially flat sheet of foam material having a substantially constant thickness, generally sheet-shaped reinforcing and stiffening means having small meshes embedded in the sheet of foam material, said meshes being of such size as to allow passage therethrough of a minor portion of said foam material toward said support surfaces when said foam material is in a prior liquid state for application on said reinforcing means and support surfaces so that, when the foam material is in a set state after application, a major portion of the foam material is retained by said reinforcing means and said minor portion of the foam material adjacent to said support surfaces has extended through and beyond the meshes of the reinforcing means and into direct contact with said support surfaces, said foam material adhering directly to said support surfaces by its own adhesiveness, said major portion and said minor portion of said foam material constitute a single integral piece of said foam material, and said minor portion of the foam material spans the hollows between adjacent ones of said support surfaces and only slightly penetrates said hollows to an extent depending on the thickness of the foam material on a side of the reinforcing means adjacent to said support surfaces.

4,558,551

SUPPORT STRUCTURE FOR SOLAR COLLECTOR

Gérard Sevelinge, Montceau-les-Mines, and Jean-Claude Pido, Le Creusot, both of France, assignors to Creusot-Loire, Paris, France

Filed Oct. 25, 1982, Ser. No. 436,756
Claims priority, application France, Dec. 11, 1981, 81 23156
Int. Cl.[4] E04H *12/18*; H01Q *1/12*
U.S. Cl. 52—646 **4 Claims**



1. Support structure for a solar collector, comprising

(a) two sets of bars linked by assembly nodes and forming two superposed triangulated lattices, including

(i) an inner lattice (1) in the shape of a concave dish centered on a sighting axis (xx') and developing, around a central node (10) located on said sighting axis, from six

inner nodes ($A_1 \ldots A_6$) forming an inner hexagon (H_1); and

(ii) an outer lattice (2) for stiffening said inner lattice (1), located outside the latter and developing from six nodes ($B_1 \ldots B_6$) forming an outer hexagon (H_2), each node of said outer lattice being connected to a corresponding node ($A_1 \ldots A_6$) of said inner lattice by a spacer bar (6) forming a strut, and located in a plane passing through said sighting axis (xx'); and

(b) an assembly component comprising

(i) a central column (3) extending along said sighting axis (xx') and having one end fixed to said central node (10) of said inner lattice (1); and

(ii) an enlarged base forming a central node (20) of said outer lattice (2) and constituted by three arms (24, 25, 26) fixed to the other end of said central column (3) and extending perpendicularly to said sighting axis (xx') in three radial half planes (P, Q, R) forming dihedral angles of 120° and passing respectively through a first three nodes (A_1, A_3, A_5) of said inner hexagon (H_1) and a first three nodes (B_1, B_3, B_5) of said outer hexagon (H_2);

(iii) the three remaining nodes (A_2, A_4, A_6) of said inner hexagon (H_1) and the three remaining nodes (B_2, B_4, B_6) of said outer hexagon (H_2) being located in bisecting half planes (P', Q', R') of said dihedral angles;

(c) each of said arms (24, 25, 26) having at its end three anchoring faces (27, 28, 29), including

(i) a central face for anchoring two oblique bars respectively connected to said nodes (A_1 and B_1, A_2 B_2, A_3 and B_3) of said inner and outer lattices (1, 2), located in the same radial half plane of said arm; and

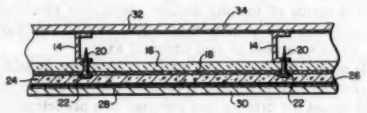
(ii) two lateral faces for anchoring two bracing bars respectively connected to the other nodes of said inner and outer lattices (1, 2) respectively located in said bisecting half planes extending on both sides of the corresponding arm.

4,558,552

BUILDING PANEL AND PROCESS FOR MAKING

Richard G. Reitter, II, Columbus, Ohio, assignor to Reitter Stucco, Inc., Columbus, Ohio

Filed Jul. 8, 1983, Ser. No. 512,025
Int. Cl.⁴ E04B *1/16;* **E04G** *21/00*
U.S. Cl. 52—741 **18 Claims**



1. A process for making a building panel comprising constructing a framework from metal channels including a top channel, a bottom channel and a plurality of intermediate channels, said intermediate channels extend from said top channel to said bottom channel and are mechanically attached to the top and bottom channels, said intermediate channels being spaced apart about sixteen to twenty-four inches, the process comprising, in sequence,

laying the framework on a horizontal surface,

applying a fiberglass panel to the upper side of the framework,

applying a metal mesh over the fiberglass panel,

securing the framework, panel and mesh together by a plurality of metal screws passing from the mesh to the framework,

providing a mixture of cement, expanded polystryene beads, the water of a consistency less viscous than putty and applying a layer of the mixture up to six inches thick to the exposed face of the mesh,

while the layer is wet, applying a fiber mesh over the layer, trowelling the mesh into the wet layer to cover all mesh fiber,

leaving the panel thus formed in stationary horizontal position for a period of about twelve to twenty-four hours until the layer achieves approximately the consistency of chedder cheese,

rasping the exposed surface of the layer at the time it is the consistency of chedder cheese to create an exposed roughened surface, and

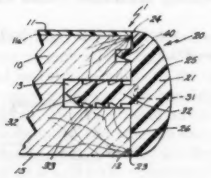
applying a coating to the rasped surface, the coating comprising a mixture of cement, aggregate, and water.

4,558,553

FURNITURE ARTICLE WITH EDGE MOLDING

Stephen B. Kolk, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Apr. 27, 1984, Ser. No. 604,467
Int. Cl.⁴ E04C *2/38;* **E04F** *19/02*
U.S. Cl. 52—829 **16 Claims**



1. An improved article of furniture having a surface defining member with a surface and an edge, said edge being finished with an elastomeric molding, said molding having a body with a decorative outer surface and an inner surface, said inner surface terminating at spaced first and second edges of said molding body, wherein said first edge is generally flush with said surface of said surface defining member when said molding is attached to said edge of said surface defining member, and mounting means projecting from said inner surface of said body and matingly engaging with a first groove located in said edge of said surface defining member, said mounting means being sufficiently large in cross-section to provide a secure connection between said molding and said edge of said surface defining member, wherein the improvement comprises in combination:

said mounting means being comprised of a slightly flexible mounting flange having a base portion adjacent said inner surface of said molding body and having a width narrower than the width of said first groove; a projecting portion extending outwardly from said base portion; groove engaging means projecting from said projecting portion for engaging with the sides of said first groove when said mounting flange is inserted therein, said groove engaging means being spaced from said base portion to allow said base portion to flex when said molding is attached to said edge of said surface defining member;

a locater rib projecting from said inner surface of said molding body, near said first edge thereof and spaced from said mounting flange;

a second groove in said edge of said surface defining member for receiving said locater rib, said second groove being located at a distance spaced from said surface of said surface defining member which is commensurate with the distance that said locater rib is spaced from said first edge of said molding body, said locater rib having a width, at least generally adjacent said molding body and for a portion of the distance of its projection from said molding body, commensurate with the width of said second groove whereby there is a snug fit between said locater rib and said second groove;

wherein said rib is inserted into said second groove to posi-

tively locate said molding with respect to said surface of said surface defining member such that said first edge of said molding is flush with said surface of said surface defining member, and wherein said mounting flange is inserted into said first groove to positively secure said molding to said edge of said surface defining member, whereby, upon attachment of said molding to said edge, said flexible base portion of said mounting flange bends within said first groove to absorb any dimensional variations occurring in said molding, said locater rib and said mounting flange thereby acting in concert to form and maintain a flush joint between said first edge of said molding and said surface of said surface defining member.

4,558,554

APPLICATION HEADS FOR APPLYING CLOSURES TO CONTAINERS

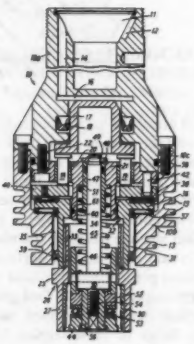
James F. Herbert, Cheslyn Hay, England, assignor to Metal Closures Limited, West Bromwich, England

Filed Oct. 26, 1983, Ser. No. 545,484

Claims priority, application United Kingdom, Oct. 29, 1982, 8231039

Int. Cl.[4] B65B *7/28*; B67B *1/06*

U.S. Cl. 53—331.5 **6 Claims**



1. Closure applying apparatus for applying a screw-threaded closure to a container, including an application head comprising a body part adapted to be driven in rotation about a lengthwise axis thereof and having an inwardly directed shoulder with an axially facing supporting surface, a rotary drive member which is journalled in the body part for rotation relative thereto about said axis and which is adapted to have connected to an end thereof an appication collet for gripping the closure, said drive member having an annular external radially-extending flange which has oppositely-facing first and second surfaces respectively facing axially towards and away from one end with said first surface facing towards said supporting surface, a pressure plate which faces said second surface of the flange and which is connected to the body part to rotate with the body part but is capable of at least a degree of axial movement relative to the body part, friction pad means disposed between the pressure plate and said surface of the flange for transmitting a drive to the rotary drive member, rotary thrust bearing elements disposed between the first surface of the drive member and said supporting surface of the body part and arranged to support the drive member in opposition to the pressure plate, and said body part housing a piston and cylinder motor connected to press the pressure plate towards said second surface of the flange with a predetermined axial force thereby to grip the friction pad means between the pressure plate and said flange, whereby rotational slip will occur between the body part and the rotary drive member when the torque applied to a collet carried by the drive member exceeds a predetermined value.

4,558,555

FEEDER E.G. FOR SOAP TABLETS TO WRAPPING MACHINE

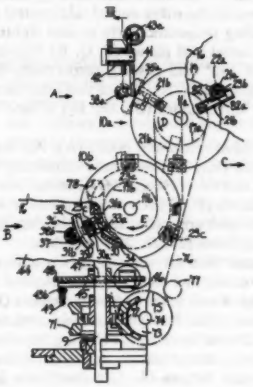
Herbert Rueff, Casalecchio di Reno, and Oscar Manfredi, Bologna, both of Italy, assignors to Azionaria Costruzioni Macchine Automatiche - A.C.M.A. - S.p.A., Bologna, Italy

Filed Jan. 27, 1984, Ser. No. 574,325

Claims priority, application Italy, Feb. 7, 1983, 3330 A/83

Int. Cl.[4] B65B *63/00*

U.S. Cl. 53—493 **6 Claims**



1. A feeder for picking up products of a generally parallelepiped shape from a pick-up station of a delivery conveyor and feeding the product to a series of containers carried at the start of a receiving conveyor, with the delivery and receiving conveyor being in substantially the same plane comprising:

(a) a carousel mounted between the pick-up station of the delivery conveyor and the start of the receiving conveyor;

(b) said carousel being mounted on an axis normal to the delivery and receiving conveyors and above the plane of the delivery and receiving conveyors;

(c) a series of feeding sucker assemblies mounted in said carousel and angularly arranged around said carousel on an axis parallel to said carousel axis;

(d) means mounting said sucker assemblies in said carousel for up and down and rotational movement on their axis;

(e) means for driving said carousel in a predetermined intermittent rotary motion so that said sucker assemblies are stationary above the pick-up station and move in synchronism with the receiving conveyor to be in registery with the containers;

(f) first control means for controlling up and down movement of said sucker assemblies along their axes arranged so that said assemblies descend and then ascend both when said assemblies are stationary at the pick-up station and when said assemblies are moving in synchronism with the receiving conveyor in register with the containers;

(g) means controlling the intermittent application of vacuum to said sucker assemblies so that vacuum is applied to effect the lifting of the products from the pick-up station and then their release into containers with which they are in registery;

(h) second control means for effecting rotational movement of said sucker assemblies around their axes so that the products lifted by them at the pick-up station are subjected, after being lifted, to a rotation so that the products are oriented in accordance with the containers of the receiving conveyor and then, while accompanying this

conveyor, to a counter-rotation to maintain the same orientation.

4,558,556

BELT HAVING A SUCCESSION OF PACKAGING BLANKS AND METHOD FOR FILLING THE BLANKS

Jan Jostler, Halmstad, Sweden, assignor to Joker System Aktiebolag, Halmstad, Sweden

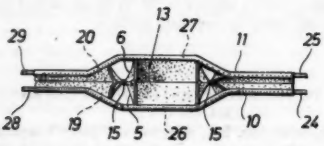
PCT No. PCT/SE81/00187, § 371 Date Jan. 29, 1982, § 102(e) Date Jan. 29, 1982, PCT Pub. No. WO82/00129, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 25, 1981, Ser. No. 354,082

Claims priority, application Sweden, Jun. 30, 1980, 8004829; Jun. 30, 1980, 8004830; Oct. 6, 1980, 8006976

Int. Cl.⁴ B65B *43/26*

U.S. Cl. 53—459 **5 Claims**



1. A method of filling packaging blanks arranged in a continuous, flexible belt having two opposing walls and longitudinal first and second edges and including a number of consecutively arranged packaging blanks each with a bottom section at the first edge and two bonding zones arranged transversely in relation to the longitudinal direction of the belt and forming side closures of each packaging blank such that each blank is open at its top at the second edges of the walls, said method comprising moving the belt of packaging blanks from an initial holding station past a filling station to a closing station, holding the belt of packaging blanks at its second edges on guide members the entire second longitudinal edges of the blanks of the belt being constrained by the guide members throughout the path of travel of the blanks from the initial holding thereof through the closing of the filling blanks, slidably advancing the belt longitudinally on the guide members, the belt being advanced past a filling station, guidably displacing the second edges of the blanks apart at the filling station while slidably advancing the second edges of the belt on the guide members to open the top of the blanks at the filling station by the guide members being contoured with diverging portions at the filling station such that the blanks are opened at said filling station solely by the guide members over which the blanks are slidingly fed, filling the thus opened blanks with its contents at said filling station, thereafter advancing the blanks beyond the filling station by slidable advance on the guide members and displacing the slidably supported second edges together on the guide members to close the top of the blanks, and separating the filled blanks from the remainder of the belt along a longitudinal strip at which the blanks are held.

4,558,557

APPARATUS FOR AUTOMATICALLY CONVERTING PILES OF FRESHLY PRINTED SHEETS OF VALUE TOKENS, IN PARTICULAR SHEETS OF BANK NOTES, INTO BUNDLE PACKS

Runwalt Kuehfuss, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Switzerland

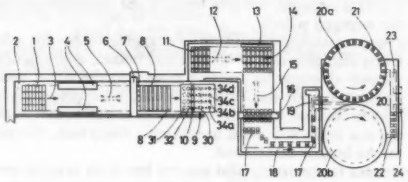
Filed Oct. 18, 1982, Ser. No. 434,887

Claims priority, application Switzerland, Oct. 22, 1981, 6740/81

Int. Cl.⁴ B65B *27/08*

U.S. Cl. 53—506 **3 Claims**

1. Apparatus for automatically converting piles of freshly printed sheets of multiple numbered value tokens, in particular sheets of banknotes, into packs of banded bundles of consecutively numbered value tokens, the apparatus comprising a strip cutting device for cutting the piles into bundle strips, a banding station for the bundle strips comprising as many banding devices, arranged adjacent one another and operating in synchronism, as there are individual value tokens per strip, a bundle cutting device for cutting the banded bundle strips into banded bundles, an intermediate store in which bundles containing value tokens of the same series are piled into bundle packs, and advancing and transporting devices for the piles, bundle strips and bundles, wherein the banding station is associated with a band detector system, which is adapted to sense an absent band



or a faulty banding operation and, before further movement of the respective bundle strip, to emit a fault signal whereby the fault position is identified and the operation of the section of apparatus including the cutting devices, the banding station, the intermediate store and the aforementioned advancing and transporting devices is interrupted, and wherein each banding device is individually operable and is provided for that purpose with an actuating element which after the occurrence of a fault signal is actuatable manually or automatically for the purpose of carrying out an individual late banding operation by means of the respective banding device.

4,558,558

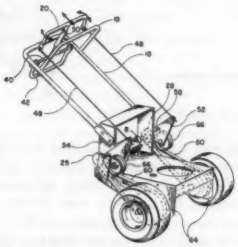
LAWN MOWER TRACTION CONTROL SYSTEM

Herbert F. Horner, Jr., Tonka Bay; Michael M. Zenner; Daniel P. Nowack, both of Minneapolis, and Herman P. Christopherson, Burnsville, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jul. 31, 1984, Ser. No. 636,428

Int. Cl.⁴ A01D *69/10*

U.S. Cl. 56—11.3 **6 Claims**



1. A self-propelled implement including two spaced apart drive wheels with brakes, at least one non-driving support wheel, a power source, a frame, transmission means including drive shafts and drive pulleys, a handle and a working element, the improvement comprising:

(a) a control bar having a downwardly extending central tube perpendicular to said bar, said tube having two diametrically opposed holes adjacent said bar, said holes prallel to said bar;

(b) a shaft transversely and pivotally mounted to said handle, said shaft having an upwardly extending central tubular stem perpendicular to said shaft, said stem sized to fit rotatably inside said tube and having two diametrically

opposed holes, said holes parallel to said shaft and slotted in a plane perpendicular to the axis of said stem and corresponding to said holes in said tube, whereby said tube fits over said stem and is secured thereto by a bolt or the like, whereby said slots allow said bar to be pivoted around said stem on a mount permitted by the dimension of said slots, and whereby the securing of tube to stem enables rotation of said bar forward and backward in an arc around said pivot shaft;

(c) means for selectively engaging one or both drive wheels for driving traction whereby the implement moves straight and the gear ratio selected when both wheels are engaged, and moves in a gradual turn when only one wheel is engaged, the turn being in the direction opposite the engaged wheel;

(d) means attached to said drive engaging means for selectively engaging one or both of said brakes, while simultaneously disengaging tractive power to the drive wheel associated with the engaged brake, whereby engaging both brakes will bring the implement to a stop, and engaging one brake will assist in making a sharp turn, pivoting on the braked wheel; and

(e) means for returning said control bar to its original position when said bar is released, thereby disengaging drive power to said wheels.

4,558,559

APPARATUS FOR PELLETIZING AND DISTRIBUTING LAWN CLIPPINGS

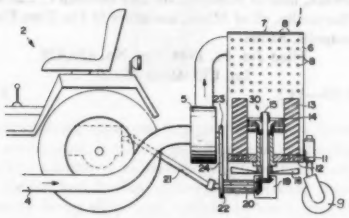
Manfred Klever, Saarbruecken-Scheidterberg, and Guenther Schlosser, Saarbruecken-Fechingen, both of Fed. Rep. of Germany, assignors to Gutbrod Werke GmbH, Saarbruecken-Buebingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 327,903, Dec. 7, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 550,107

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048364

Int. Cl.[4] A01D *84/00*

U.S. Cl. 56—16.4 **14 Claims**



1. An apparatus for pelletizing and distributing an organic grass type material, comprising tractor means (3) having a power take-off shaft (21), a housing operatively connected to said tractor means for moving said housing by said tractor means, air flow conveying means for feeding the organic material into said housing at an upper unobstructed portion of said housing, vent holes (8) in said upper housing portion located so that said organic material falls down by gravity while air of said air flow can escape through said vent holes, strand forming means arranged in said housing as a substantially horizontal bottom wall (11) of said housing, said bottom wall (11) having extrusion holes (12) therein, compression means operatively arranged in said housing for cooperation with said strand forming means, said compression means comprising a plurality of compression rollers (13), each compression roller having a substantially horizontally extending rotational axis (31), said rollers (13) having surfaces riding over said extrusion holes (12) in said bottom wall, said roller surfaces being fully exposed to organic material falling down by gravity substantially throughout the entire upper unobstructed housing portion for pressing said organic material through said extrusion holes, drive means operatively connecting said compression rollers to said power take-off shaft, said drive means comprising a rotating central driven shaft (15), first means (32) drivingly connecting said central driven shaft to said rotational axes (31) for moving said rotational axes (31) in a plane extending substantially perpendicularly to said driven shaft (15), and second means (37, 39) rotatingly connecting said rotational axis (31) also to said driven shaft (15) for also positively rotating said compression rollers (13) about said rotational axes (31) in said housing to press the organic material through said extrusion holes for forming strands of organic material emerging downwardly out of said housing, chopping-up means operatively arranged below said bottom wall for cooperation with said strand forming means in chopping-up strands as they emerge from said extrusion holes, and third means (18') connecting said chopping-up means to said driven shaft (15) for rotating the chopping-up means also from said power take-off shaft to pelletize the strands and distributing the resulting pellets outside said housing onto a surface to be fertilized as said tractor means move said housing over said surface.

4,558,560

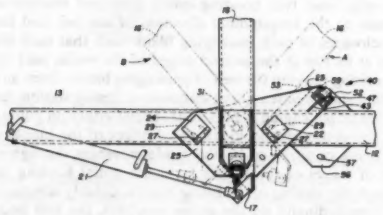
PIVOT TONGUE HARVESTER WITH LATERAL TRANSPORT

Earl E. Koch, Mohnton, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 19, 1984, Ser. No. 652,365

Int. Cl.[4] A01B *73/00*

U.S. Cl. 56—228 **18 Claims**



1. In a harvesting machine having a mobile frame adapted for movement over the ground; harvesting apparatus supported by said frame to harvest crop material; a drawbar having one end pivotally connected to said frame for pivotal movement through an operative range of generally longitudinally extending angular positions relative to said frame and a distal end adapted for connection to a prime mover said range of angular positions being limited by first and second stops mounted on a support plate; and an actuator interconnecting said drawbar and said frame to effect the movement of said drawbar through said operative range, the improvement comprising:

said support plate being movable from a first position corresponding to said operative range and a second position in which the corresponding positioning of said stops permits said drawbar to be positioned in a transversely extending direction.

4,558,561

MECHANICAL FRUIT PICKER

Harold P. Mendenhall, Star Rte. 1, Box 30, Lehi, Utah 84043

Filed Aug. 26, 1983, Ser. No. 526,527

Int. Cl.[4] A01D *46/24*

U.S. Cl. 56—328 R **1 Claim**

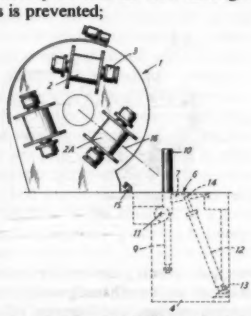
1. A mechanical fruit picker assembly for attachment to and use with a powered transporting vehicle, said assembly comprising:

suction tubes means operably attachable to said vehicle, said

suction tube means including an expanded nozzle portion for positioning over fruit to be picked and further including at least one foam paddle arrangement fixedly secured therein, said foam paddle arrangement being of a flexible construction whereby movement of said fruit through said suction tube means is interfered with, thereby to effect a slowing of movement of such fruit to thus prevent fruit damage, said suction tube means further having an end portion positioned within a trailer means attached to said vehicle, said end portion being selectively positionable whereby a rate and distance of fruit movement is minimized, thereby to reduce fruit damage, said trailer means being lined with a padding means to further reduce fruit damage, said suction tube means being selectively extensible and contractable to control a positioning of said nozzle portion;

adjustable nozzle means attached to a fruit receiving end of said suction tube means, said adjustable nozzle means including an expanded diameter portion defining said expanded nozzle portion to facilitate a positioning of said suction tube means over said fruit, said adjustable nozzle means further including an adjustable valve means for controlling an amount of suction within said suction tube means;

further valve means on a fruit depositing end of said suction tube means, said further valve means being movcable in one direction to permit said fruit to be deposited in said trailer means and at other times being in a normally closed position whereby reverse air flow through said suction tube means is prevented;



suction tube support means including at least one bifurcated support swivelly mounted on a topmost portion of said vehicle, said suction tube means being slidably positioned between spaced-apart arms defining said bifurcated support, said support further including an angulated transversely-extending arm portion which substantially increases its arc of rotation, thereby to increase an extent of operable movement of said suction tube means;

first work station means operably positionable on said vehicle, whereby an operator may be located on said first work station means during a fruit picking operation, said first work station means being vertically adjustable by a first hydraulic actuator means and being horizontally adjustable by a second hydraulic actuator means, such vertical and horizontal adjustment being effected by said operator through a manual operation of control means positionable on said first work station means;

second work station means operably attached to said trailer means, said second work station means permitting a second operator to stand thereon while controlling the positioning of said fruit depositing end of said suction tube means; and

power supply means for operably effecting a suction flow of air within said suction tube means, whereby said suction flow of air may be utilized to separate said fruit from said tree and effect flowthrough of said fruit through said suction tube means, said power supply means including a blower means operably interconnected between a power take-off of said vehicle and said suction tube means, said blower means including a conduit means attached between an intake portion of said blower means and an intermediate portion of said suction tube means, thereby to establish fluid communication therebetween and to effect said suction flow of air within said suction tube means.

4,558,562

SPINNING AGGREGATE FOR WRAPPED YARN

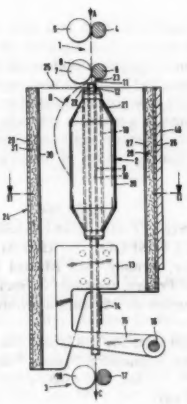
Fritz Stahlecker, Josef-Neidhart Strasse 18, 7347 Bad Überkingen, and Kurt Lang, Lauterstein, both of Fed. Rep. of Germany, assignors to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,378

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331197

Int. Cl.⁴ D02G *3/36, 3/38*

U.S. Cl. 57—18 **20 Claims**



1. A spinning aggregate for spinning sliver and binding yarn into a wrapped yarn comprising:

a drivable hollow spindle carrying a corotating sleeve with a binding yarn wound on said sleeve,

a corotating positive false-twising device into which binding yarn and a sliver enter,

a delivery mechanism having a pair of delivery rollers forming a nip for feeding said sliver,

a pair of withdrawal rollers following the hollow spindle,

wherein the distance between the false-twisting device and the nip of the pair of delivery rollers is shorter than the median staple length of the sliver.

4,558,563

STRANDING MACHINES

Alan Witherden, Gravesend, England, assignor to Cortinovis S.p.A., Bergamo, Italy

Filed Jul. 6, 1984, Ser. No. 628,442

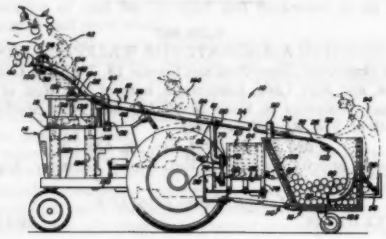
Claims priority, application United Kingdom, Jul. 12, 1983, 8318814

Int. Cl.⁴ D07B *7/00;* **D01H** *9/00*

U.S. Cl. 57—266 **7 Claims**

1. A device for use in loading supply bobbins into a stranding machine of the kind having a generally horizontal rotary axis and arranged to carry bobbins between loading pintles with rotary axes of said bobbins disposed tangentially to a circle generated by a radius from the rotary axis of the stranding machine, comprising a loading platform arranged for location at a position laterally adjacent to the stranding machine at or near floor level in order to receive bobbins to be loaded therein

with their rotary axes disposed horizontally and transverse with respect to the rotary axis of the stranding machine, and an elevator device arranged to transmit to said loading platform a two-stage movement wherein the platform is initially tilted about a horizontal axis to bring the axis of a bobbin carried by



said platform into a position oblique to the rotary axis of the stranding machine and is then moved rectilinearly along a path inclined obliquely upwards and radial to the rotary axis of the stranding machine to a position wherein the supply bobbin or bobbins supported thereon are located in position for engagement with the loading pintles of the stranding machine.

4,558,564

INTER-SHAFT JOURNAL ASSEMBLY OF A MULTI-SPOOL TURBO-MACHINE

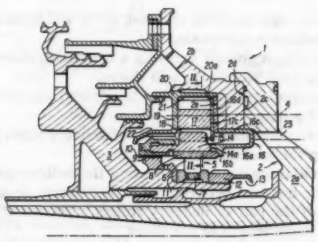
Jean G. Bouiller, Brunoy, and Marcel R. Soligny, Chevilly-Larve, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Oct. 18, 1983, Ser. No. 543,047

Claims priority, application France, Nov. 10, 1982, 82 18863

Int. Cl.[4] F02C *1/06*

U.S. Cl. 60—39.161 **5 Claims**



1. In a turbo-machine multi-spool inter-shaft bearing assembly comprising a first shaft of the low-pressure spool shaft line, a second shaft of the high-pressure spool shaft line located coaxially with the first shaft, journal bearing means including an internal ring rotatable with the second shaft, an external ring mounted within a ring support assembly for rotation with the first shaft and roller bearing members operative between said internal and external rings, the improvement comprising

a first toothed element,

a second toothed element and,

an intermediate part, said ring support assembly comprising said elements and said intermediate part, the toothed elements meshing with minimal clearance between meshing parts, and the intermediate part being secured for rotation with the first shaft, and

a body of revolution having a cross-section that includes a substantially U-shaped channel section, serving to locate axially said ring-support assembly and being secured to the first shaft for rotation therewith,

wherein the low pressure shaft further comprises a radial face and the first toothed element of the ring support assembly comprises a plurality of regularly-spaced teeth on its outer periphery, and the second toothed element comprises a plurality of paired parts, the outline of each pair of parts being capable of being inscribed within the volume of an imaginary right triangular prism of which one of the apices is replaced by a groove formed between adjacent teeth of said second toothed element, said groove having a width matched to the width of a corresponding tooth of said first toothed element, and wherein said bearing assembly further comprises means securing the plurality of paired parts of the said low pressure spool shaft against the said face of the low pressure shaft.

4,558,565

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

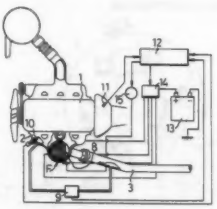
Akikazu Kojima, Hamamatsu, and Shigeru Kamiya, Chiryu, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 15, 1983, Ser. No. 475,625

Claims priority, application Japan, Mar. 16, 1982, 57-41557; Mar. 20, 1982, 57-45046; Jun. 21, 1982, 57-106390

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—286 **12 Claims**



1. An exhaust gas cleaning device for collecting exhaust particulates contained within exhaust gases discharged from an internal combustion engine, and burning off the collected exhaust particulates, comprising:

a casing provided in an exhaust gas of said internal combustion engine;

a filter member, within said casing, for collecting exhaust particulates within said exhaust gases;

an electrically heating member for heating and igniting said exhaust particulates collected by said filter member, which heating member is positioned upstream of said filter member;

means for detecting an amount of exhaust particulates collected by said filter means;

a heating member control means for operating said heating member when said detecting means detects a predetermined collected amount of exhaust particulates;

a by-pass passage for permitting exhaust gases to by-pass said filter member, which communicates with the upstream end portion and the downstream end portion of said casing; and

a valve plate member which can be positioned either for closing said by-pass passage and flowing all of the exhaust gases into said filter member or opening said by-pass passage to flow almost all of the exhaust gases into said by-pass passage while permitting a small amount of exhaust gases to flow into said filter member; and

valve control means for controlling the position of said valve plate member such that the by-pass passage is closed when the particulate amount is under said predetermined amount, and the by-pass passage is opened to a degree

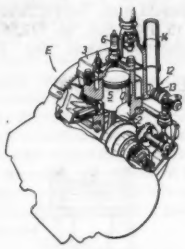
determined by the amount of exhaust gas discharged by the engine when the particulate amount is above said predetermined amount.

4,558,566

APPARATUS FOR CONTROLLING EXHAUST SYSTEM OF INTERNAL-COMBUSTION ENGINE

Masaru Shirakura, Musashino, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,240
Claims priority, application Japan, Jun. 22, 1982, 57-107318
Int. Cl.⁴ F02B *27/02*
U.S. Cl. 60—314 **10 Claims**



1. In an apparatus for controlling an exhaust system of an internal combustion engine comprising a resonance chamber having its terminating end closed and communicating with an intermediate portion of an exhaust passage of the internal combustion engine, and a stop valve provided at the inlet of said resonance chamber for opening or closing said inlet in a predetermined operation region of the engine, the improvement wherein said stop valve is actuated to effect its opening/-closing operation in accordance with a predetermined operation region of said engine by means of a governor mechanism actuated in response to the rotation of a crankshaft of said engine, means for transferring motion between said governor mechanism and a rotary shaft, said governor mechanism acting to control the rotation of said rotary shaft, said rotary shaft having a driving lever fixed thereto so as to be rotatable integrally with said rotary shaft, said driving lever being connected to a shift lever by means of a resilient spring member so that said driving lever is swingable relative to said shift lever, and said shift lever being adapted for opening and closing said stop valve while being supported by said rotary shaft so as to be swingable about said rotary shaft.

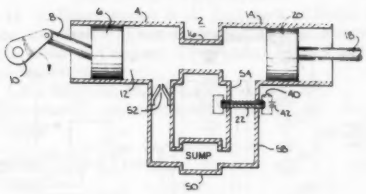
4,558,567

CONTINUOUSLY VARIABLE TRANSMISSION

Herman P. Schutten, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1984, Ser. No. 602,339
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.⁴ F15B *15/18*
U.S. Cl. 60—544 **2 Claims**

1. A continuously variable transmission, comprising:
a constant displacment pump of fixed fluid power stroke;
a fluid motor driven by said pump and having an output stroke;
microporous valve means comprising a high speed, low mass valve communicating with said pump and said motor and selectively actuatable by micromovement to a macro-opening for varying said output stroke without varying said power stroke, said valve means being actuatable during said power stroke to terminate said output stroke, yet permit continuance of said power stroke, whereby to variably modulate the duration of said output stroke while maintaining a constant said power stroke, said microporous valve means comprising:
a first planar sheet-like electrically conductive film having an electrically insulative face surface on one side thereof and an array of microapertures through said film and face surface;
a second planar sheet-like electrically conductive film abutting said insulative face surface on the opposite side



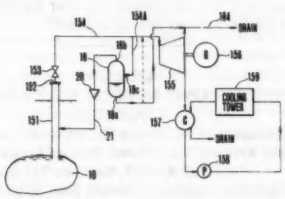
thereof from said first film, and having an array of microapertures through said second film nonaligned with said first mentioned array;
electric circuit means for supplying electric current flow through said first and second films to effect relative transverse movement therebetween due to interacting electromagnetic fields, to open passages through said apertures allowing transverse fluid flow through said films.

4,558,568

METHOD AND APPARATUS FOR MOBILIZING GEOTHERMAL FLUID

Yuji Hoshino, Yachiyo City; Hajime Endou, Tama City, and Kazuyoshi Suda, Funabashi City, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Division of Ser. No. 415,701, Sep. 7, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,372
Int. Cl.⁴ F03G *7/04*
U.S. Cl. 60—641.5 **4 Claims**



1. A method of utilizing geothermal fluid comprising the steps of:
producing geothermal fluid drawn from an underground substratum through a production well;
separating steam from said geothermal fluid drawn from said underground substratum through said production well;
compressing said separated steam to a pressure higher than that of said geothermal fluid;
blowing said compressed steam into said production well so as to increase the pressure and temperature of said geothermal fluid in said production well and to increase a quantity of said geothermal fluid produced; and
supplying said geothermal fluid drawn from said underground substratum through said production well directly to a fluid utilizing device;
wherein said fluid utilizing device is a total flow turbine for driving an electric generator.

4,558,569

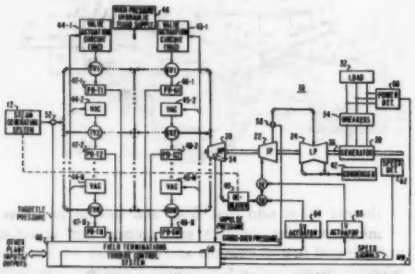
STUCK PUSHBUTTON CONTINGENCY OPERATION FOR A STEAM TURBINE CONTROL SYSTEM

Eddie Y. Hwang, Winter Park, Fla.; Wu-Shi Shung, South Windsor, Conn., and Robert L. Osborne, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,720

Int. Cl.[4] F01K *13/00*

U.S. Cl. 60—657 **6 Claims**



1. In a steam turbine control system operable in an automatic or manual control mode for controlling movement of the steam admission valves of the steam turbine, the improvement comprising:

(A) a pair of manually activated switches for respectively opening and closing said valves at a first predetermined rate, when in said manual control mode;

(B) a set of additional switches for changing the rate of movement of said valves;

(C) control means operable in a normal mode of operation to control said valves in accordance with the activated or deactivated state of said switches and to switch to a special mode of operation if said pair of switches are both closed for a predetermined period of time;

(D) said control means being operable in said special mode of operation to move said valves at a predetermined rate only when a switch of said pair and a switch of said set are both activated and to switch back to said normal mode of operation if the switches of said pair are both deactivated for a predetermined period of time.

4,558,570

COMPRESSOR UNIT IN SPLIT CYCLE CRYOGENIC COOLERS

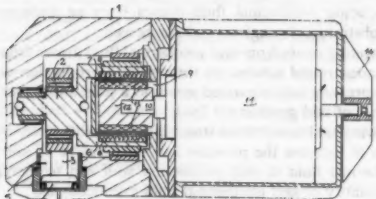
Shmuel Shtrikman, 1 Hasharon St., Rehovoth, and Menachem Danziger, Kibbutz Eyn Charod, both of Israel

Filed Jul. 8, 1983, Ser. No. 512,420

Claims priority, application Israel, Dec. 9, 1982, 67440

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **2 Claims**



1. In a cryogenic cooler system of the Stirling split type comprising a casing, a compressor unit sealed into said casing, said compressor unit including a crankshaft, and a piston, and said crankshaft connected to said piston for supplying linear movement thereto, an electromotor positioned outside of said casing and forming the drive for said compressor unit, said electromotor including a shaft, magnetic coupling means being provided transmitting rotational movement from the shaft of the electromotor to said crankshaft, said electromotor has a part of said shaft extending from the motor casing opposite the magnetically coupled shaft end, and a fan mounted on said extending part of said shaft.

4,558,571

WATER HEATING DEVICE OF HEAT PUMP TYPE

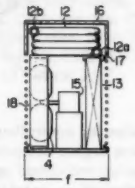
Shinya Yoshinaga, and Hiroyuki Iwamura, both of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,562

Claims priority, application Japan, Sep. 22, 1982, 57-142671[U]

Int. Cl.[4] F25B *27/02*

U.S. Cl. 62—238.6 **2 Claims**



1. A water heating device of heat pump type comprising a compressor, an evaporator, a duplex-pipe condenser and a blower means positioned within an outer case, characterized in that said blower means and said compressor are arranged horizontally with respect to one another and, at the back of this arrangement, said evaporator is disposed, and said duplex-pipe condenser is wound in a slender elliptic form and is disposed on top portions of said evaporator and blower means.

4,558,572

CONTACT FREEZING APPARATUS

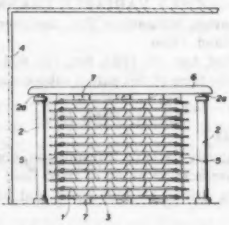
Shigetada Aoki, Chofu; Masahiko Usui, Tokyo, and Kojuro Kitano, Chiba, all of Japan, assignors to Taiyo Fishery Co., Ltd. and Mayekawa Mfg. Co., Ltd., both of Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,502

Claims priority, application Japan, May 4, 1983, 58-77397

Int. Cl.[4] F25D *25/00*

U.S. Cl. 62—378 **5 Claims**



1. A contact freezing apparatus for a freezing room comprising:

a plurality of generally horizontal freezing plates in stacked arrangement, in which freezing medium is circulated to form upper and lower cooling surfaces, adjacent plates having lost-motion connection at a predetermined vertical interval, said plates being adapted to have freezing pans

containing articles to be frozen supported on their upper surfaces;

first elevating-and-lowering means for elevating an uppermost plate until each plate therebelow is suspended from the plate immediately thereabove and then lowering said uppermost plate until each plate above the lowermost makes contact with the pan supported on the plate immediately therebelow;

second elevating-and-lowering means for elevating at least one specific plate from a position wherein all said plates below the uppermost are suspended to a position wherein said lowermost plate is located at a predetermined position in height, and then lowering the specific plate to its suspended position; and

means for engaging said specific plate with said second means upon elevating movement thereof, and then disengaging said specific plate from said second means upon completion of lowering movement thereof,

said engaging and-disengaging means comprising, arm means movable mounted on said second means and having at one end thereof supporting members for supporting the specific plate, said arm means being adapted to move said members into supporting engagement with the specific plate on elevating movement of said second means, and then to move said members into disengagement with the specific plate on completion of lowering movement of said second means.

4,558,573

DEVICE FOR OIL COOLING IN A COMPRESSION UNIT AND, PARTICULARLY, A SCREW COMPRESSION UNIT

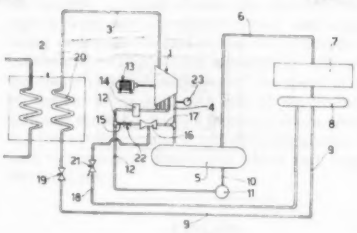
Gaspare La Monica, Brugherio, Italy, assignor to Samifi Babcock, S.p.A., Milan, Italy

Filed Sep. 26, 1984, Ser. No. 655,023

Claims priority, application Italy, Sep. 30, 1983, 23071 A/83

Int. Cl.[4] F25B *43/02*

U.S. Cl. 62—473 **3 Claims**



1. A closed refrigeration system comprising a screw compressor for refrigerant gas, an oil-gas separator, a condenser for condensing the compressed refrigerant gas, a receiver for condensed refrigerant and an evaporator,

a first line for conducting compressed refrigerant gas from said compressor to said oil-gas separator,

a second line for conducting compressed refrigerant gas from said separator to said condenser,

a third line for conducting condensed refrigerant from said condenser to said receiver,

a fourth line for conducting liquid refrigerant from said receiver to said evaporator,

a fifth line for conducting refrigerant gas from said evaporator to said compressor,

a sixth line for conducting oil from said oil-gas separator to said compressor, said sixth line comprising a pump for delivering oil under pressure to said compressor,

a seventh line leading from a first junction in said sixth line downstream of said pump to a second junction in said first line between said compressor and said oil-gas separator, said seventh line having therein an ejector with a throat, and

an eight line leading from said receiver to the throat of said ejector,

whereby oil forced by said pump through said ejector in said seventh line produces in the throat of said ejector a vacuum for drawing refrigerant liquid from said receiver through said eight line into said seventh line.

4,558,574

WOOL WASHING AND RECOVERY OF WOOL WAX AND WATER THEREFROM

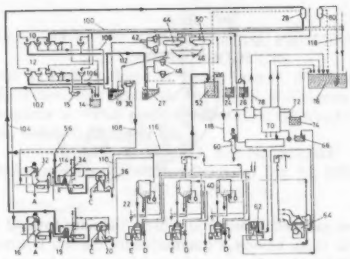
Oskar H. G. Beier; Joseph B. J. Kerf, both of Natal, South Africa, and Sven G. Ekegren, Uttran, Sweden, assignors to O.T.H. Beier & Company (Proprietary) Limited and Alfa-Laval Separation AB

Filed Jul. 19, 1983, Ser. No. 514,797

Claims priority, application South Africa, Jul. 21, 1982, 82/5207

Int. Cl.[4] D01C *3/00*

U.S. Cl. 68—18 R **2 Claims**



1. A wool washing apparatus, comprising means for establishing a plurality of washing zones, means for introducing hot water to one or more of the washing zones, means for withdrawing a first wax rich stream from said zone or zones and means for discharging a second sludge and wax stream from outlets at or adjacent a bottom of said zone or zones, there being means for introducing cold water to one or more further zones used for at least one of a pre-wash and final rinse zone or zones, the outlet of said at least one pre-wash and final rinse zone or zones forming a third low wax containing sludge stream, the apparatus further including means for removing sludge from the second stream and for recovering wax from the first and second streams, and for returning a major portion of the supernatant liquor containing soluble salts from the first and second streams to the washing zones, and for mixing with the third stream a minor portion of said liquor containing sufficient soluble salts for destabilizing the third stream, separating the resulting wax from the destabilized third stream to form a wax free effluent, and leading the wax free effluent to a final treatment stage.

4,558,575

MACHINE FOR LIQUID TREATMENT OF FABRICS

Jose-Maria C. Serracant, and Juan C. Serracant, both of Paseo Can Feu, 68/80, Sabadell, Spain

Filed Feb. 28, 1984, Ser. No. 584,406

Int. Cl.[4] D06B *5/22*

U.S. Cl. 68—181 R **6 Claims**

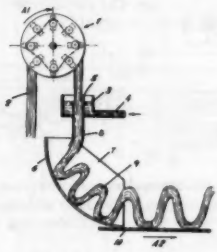
1. In a machine for liquid treatment of fabrics in rope form in a closed loop, including driving means for continuously moving the fabric rope, means for impregnating the fabric rope with the treatment liquid, means for folding the fabric rope, and mechanical conveyor means for conveying the impregnated fabric rope in the loop, the improvement comprising:

a draw winch for optimum driving of the fabric rope produced by a maximum dragging circumference in contact with said fabric rope, including a rotatably driven shaft,

two separated plates mounted on said shaft to be rotated thereby, and a plurality of rods fitted between said two plates, with the ends of the rods mounted in said plates, said rods being inclined with respect to said plates with the inclination of adjacent rods being oppositely directed, the fabric rope being run on said rods in engagement therewith to produce a continuous motion of said fabric rope;

a reservoir located downstream of said draw winch having an inlet for the treatment liquid;

a guide tube extending through the bottom of said reservoir having a funnel-shaped spill edge at the upper end thereof in said reservoir so that the treatment liquid flows over said spill edge and through said guide tube by gravity, said fabric rope passing through said funnel-shaped end and guide tube to produce intense impregnation of the fabric without any dragging effect;



an open inclined channel in which folds are formed in the fabric rope, having a longitudinally curved bottom, upstanding sidewalls, an upper end located under said reservoir and guide tube for receiving therefrom the impregnated fabric rope and the treatment liquid flowing through the guide tube, and a lower end from which said fabric rope is discharged from the channel; and

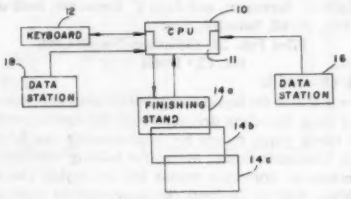
a mechanical conveyor device, at least part of which is located under the lower end of said channel to receive the fabric rope and treatment liquid therefrom and driven in synchronization with said draw winch, including means to allow said treatment liquid to pass through it for separation of the liquid from the fabric rope, and means for moving the fabric rope to a position substantially under the draw winch where the fabric rope is removed from the conveyor device by said draw winch.

4,558,576

AUTOMATIC GAUGE CONTROL SYSTEM FOR MULTI-STAND TIED BLOCK ROD ROLLING MILL

Richard J. Reardon, Boylston; Endre S. Maroti, Shrewsbury; Colin Roy, Worcester, and John S. Lindsay, Shrewsbury, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Nov. 14, 1983, Ser. No. 550,800
Int. Cl.⁴ B21B *37/12*
U.S. Cl. 72—9 **9 Claims**



1. A method for controlling the gauge of a product being rolled through a rolling mill, which rolling mill has a plurality of successive mechanically interconnected finishing stands, each finishing stand having a pair of work rolls which define a roll pass, said work rolls driven by a common drive, which method includes:

rolling the product through the roll passes of the successive finishing stands;

measuring the transverse dimensions of the product exiting from the last finishing stand;

determining if the measured transverse dimensions of the exiting product are within preestablished limits and when said measured transverse dimensions are beyond said limits;

calculating an adjustment to the work rolls of at least one selected finishing stand, the said adjustment being that required to bring the transverse product dimensions within said limits, said selected finishing stand being downstream of the first finishing stand; based on the calculated adjustment to the work rolls of said selected finishing stand, calculating whether progressively smaller adjustments to the work rolls of additional selected finishing stands preceding said selected finishing stand are required; and

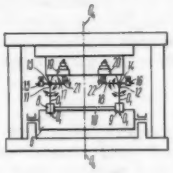
determining if the calculated adjustments are feasible, and if feasible, performing said adjustments.

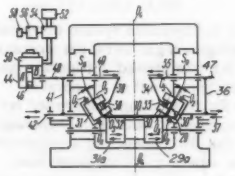
4,558,577

ROLL-FORMING MACHINE FOR MAKING ARTICLES HAVING CROSS-SECTIONAL CONFIGURATIONS VARYING LENGTHWISE

Igor S. Trishevsky; Ivan E. Patseka; Eduard M. Temnikov; Alexandr G. Borisenko; Mark E. Doktorov, all of Kharkov; Grigory R. Kheifets, Kramatorsk; Vladimir V. Lanko, and Sergei V. Miroshnichenko, both of Kharkov, all of U.S.S.R., assignors to Ukrainsky Nauchnoissledovatelsky Institut Metallov, Kharkov, U.S.S.R.

Filed Jan. 4, 1983, Ser. No. 455,577
Int. Cl.⁴ B21D *5/08, 5/14*
U.S. Cl. 72—12 **4 Claims**





1. A roll-forming machine for making articles having cross-sectional configurations varying lengthwise thereof, comprising:

a plurality of roll-forming stands positioned in a series defining a path of movement of an elongated workpiece to be formed;

means for moving the workpiece to be formed longitudinally along said path;

a plurality of groups of associated forming members of which at least two groups are mounted on each of said plurality of roll-forming stands for progressively trans-

forming the workpiece from an initial configuration as the workpiece moves along said path by progressively deflecting at least portions of the workpiece away from said path;

means for effecting transverse movement of said plurality of groups of associated forming members relative to the path of movement of the workpiece;

means for monitoring the width of the workpiece to be formed relative to the path of workpiece movement as the workpiece moves through said groups of associated forming members, which monitoring means is arranged at the entry side of the roll-forming machine and comprises:

a converter for controlling the transverse movement of said plurality of groups of associated forming members in accordance with a varying transverse dimension of the workpiece, said converter being positioned to be adjacent the edge of the workpiece as it moves into the roll-forming machine and comprising:

follower means pivotable in a substantially vertical plane,

a roller mounted on the end of said follower means for rotation in a substantially horizontal plane, and

means for urging said roller into continuous contact with the edge of the workpiece, and path control transducer means operatively connected with said follower means to provide a width signal, whereby variations in a transverse dimension of the workpiece produce movement of said follower and are converted by said transducer means into an output electrical signal for controlling the transverse movements of said plurality of groups of associated forming members;

means for varying the positioning of said plurality of groups of associated forming members transversely with respect to said path of workpiece movement as the workpiece is being formed, said means being connected to said converter and including programming means responsive to said width signal for setting the direction of transverse movements of the forming members and the speed of such movements, a signal divider for dividing the position signals from said transducer means, said signal divider being connected to said means for effecting transverse movements of the forming members for selectively sending thereto signals indicative of the speed of workpiece movement along said path and of the position of said follower means to define a forming pattern, thereby forming the workpiece into a desired configuration characterized by transverse dimensions which vary lengthwise of the workpiece.

4,558,578

METHOD OF AND APPARATUS FOR MAKING THIN METAL STRIP

Oskar Noé, Mühlheim-Ruhr; Rolf Noé, Berlin-Charlottenburg, and Andreas Noé, Aachen-Richterich, all of Fed. Rep. of Germany, assignors to BWG-Bergwerk- und Walzwerk-Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Nov. 18, 1982, Ser. No. 442,763

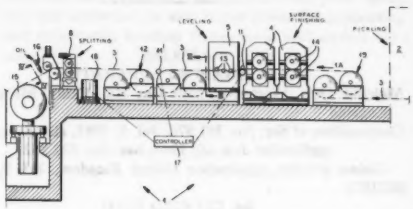
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203581

Int. Cl.⁴ B21B *45/06, 15/00, 39/08*

U.S. Cl. 72—39 **12 Claims**

1. In the process of producing a thin, hot-rolled metal strip from a starting metal slab of substantial thickness, wherein (i) the starting metal slab is passed through a hot-rolling mill and thereat is rolled down and transformed into a metal strip the thickness of which is substantially the lowest attainable thickness for the strip, and (ii) the resultant strip, upon leaving the hot-rolling mill, is passed through a pickling line including a main section providing a pickling bath and an adjoining exit section; the improvement consisting essentially of the steps of:

(a) immediately after the pickled strip leaves the pickling bath subjecting the pickled strip, while the same is under tension in the exit section of the pickling line and without being first oiled and/or coiled, to a composite aftertreatment consisting, in sequence, of a skin-pass operation



followed by a bend-leveling operation both performed by rollers engaging the opposite surfaces of the strip; and

(b) thereafter coiling the aftertreated strip.

4,558,579

APPARATUS FOR HYDROPLASTIC PROCESSING OF TUBULAR PRODUCTS

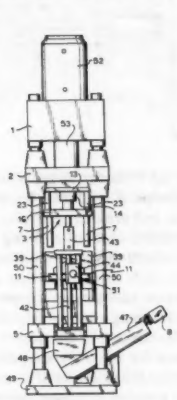
Georgi K. Petkov; Botyo P. Botev; Ivan H. Naydenov; Georgi M. Metev, and Yakim N. Petrov, all of Gabrovo, Bulgaria, assignors to NPSP po Hydroplastichna Obrabotka na Metalite, Gabrovo, Bulgaria

Filed Nov. 16, 1983, Ser. No. 552,463

Claims priority, application Bulgaria, Jan. 11, 1983, 59297

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—56 **12 Claims**



1. Apparatus for the hydroplastic deformation of the interior of a tubular product having a passage therethrough, comprising a vertical hydraulic press having a movable slide and a work table, to the movable slide there being attached a base plate carrying a broaching rod adapted to have a broaching tool mounted on the lower end thereof, the broaching rod thrusting the broach through the passage in the product, means to introduce hydraulic fluid under high pressure between the broaching tool and zone of the inner wall of the passage through the product which is being worked by the broach, whereby such zone is hydraulically plastically deformed by such high pressure fluid, a knock-out rod secured to the base plate, the said knock-out rod lying parallel to the broaching rod and spaced therefrom, a positioning fixture disposed upon the work table, said fixture including a shiftable die-carrying plate having a die mounted thereon adapted to receive therewithin a hollow billet to be processed by the apparatus, and means to shift the die-carrying plate from a first working position in which the die and the billet therein are aligned with the

broaching rod to a second working position wherein the die is aligned with the knock-out rod.

4,558,580

COIL SHAPING APPARATUS

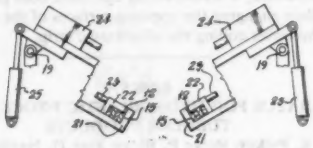
Malcolm Otty, Westering, Mill Hay Rd., Caldy, Merseyside, England

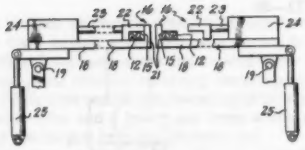
Continuation of Ser. No. 281,676, Jul. 9, 1981, abandoned. This application Jun. 19, 1984, Ser. No. 622,152

Claims priority, application United Kingdom, Jul. 9, 1980, 8022522

Int. Cl.⁴ B21D *11/00*

U.S. Cl. 72—301 **7 Claims**





1. A shaper for coils for larger electrical machines, which coils comprise loops of conductor having a generally rectangular cross section and are of a generally rectangular shape with two straight parallel sections defining a plane with inwardly directed faces which face one another, said straight sections being joined by ends of the coil that meet with said straight sections in corners, said shaper comprising:

grippers for gripping each of said straight parallel sections adjacent the corners of the coil;

support means for movably supporting the grippers in an initial position for insertion of an elongated loop coil blank and a final position in which the coil is shaped; and

power means for moving said grippers from said initial position to said final position, wherein said grippers each include a gripping element having a gripping portion engaging said inwardly directed faces of said coils, said gripping portions extending substantially parallel to said inwardly directed faces and to one another when said grippers are in said initial position, each gripper being positioned on said support means such that the support means forms a part of the gripping element, in conjunction with the gripping portion, for engaging the straight section of the coil, the support means which forms a part of the gripping element extends transverse to the gripping portion;

wherein in said final position said gripping portions are moved downward and rotated from said initial position such that normal lines from said gripping portions intersect one another below said gripping portions,

whereby said inwardly directed faces are turned downward and said ends of said coil kink downwardly from said plane containing said straight sections.

4,558,581

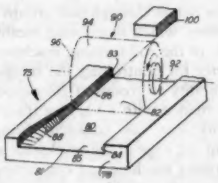
GUIDING AN ADVANCING STRIP

Ray T. Goulstone; Michael T. Gursky, both of Allentown, and John M. O'Boyle, Bethlehem, all of Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 16, 1983, Ser. No. 533,029

Int. Cl.⁴ B21C *37/02, 47/34;* B26D *7/14*

U.S. Cl. 72—379 **6 Claims**



1. A method of advancing and guiding, for printing a precise pattern therein, a flat strip having no substantial resistance to bending, comprising:

supporting the strip along a substantially straight and flat path, coextensive with and spatially related to an adjacent wall utilized as a reference datum for laterally guiding the strip;

advancing the strip along the path;

forming a standing ridge to serve as a guiding member having a reference edge along the side of the strip adjacent the reference wall such that the ridge and adjacent sheet portions have resistance to bending sufficient to protect residue portions of the sheet from unacceptable deformation;

biasing an elongate, substantially flat member upon the flat, residue portions of the strip and onto the flat path while substantially simultaneously biasing a side of the flat member against the standing ridge and onto the reference wall as the strip advances along the reference wall such that the strip follows a sufficiently precise path for printing the pattern; and

altering portions of the edge guiding member after such portions have traversed the path along the reference wall so that the strip may be wound upon a reel.

4,558,582

APPARATUS FOR FLANGING VENTILATION DUCT WALLS

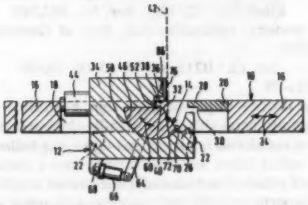
Manfred Meinig, Seitinger Str. 186, 7201 Weilheim, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,989

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237928

Int. Cl.⁴ B21D *5/02*

U.S. Cl. 72—381 **22 Claims**



1. Apparatus for flanging the walls of ventilation ducts of sheet metal by successive edge folding and roll forming, with at least three parts mutually displaceable by hydraulic drive, of which a first part comprises a forming roller, the second part

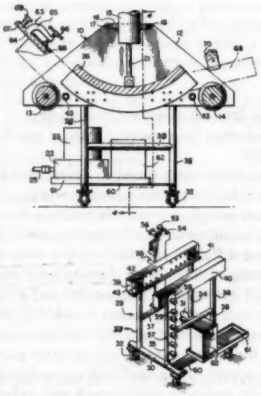
comprises a die support which contains a pressure die and the third part comprises a beam punch carrier which carries a beam punch which can be pressed against the pressure die, that the die support and the beam punch carrier are housed for low-friction mutual horizontal displacement, that a first hydraulic drive is supported between the die support and the beam punch carrier, that the forming roller is pivotably housed in the die support and that a second hydraulic drive is supported between the die support and the forming roller the improvement comprised of an outwardly directed bevel in cross section positioned on a side of the pressure die formed by the forming roller, said bevel matching a corresponding bevel positioned on the beam punch so that said beam punch and forming roller cooperate to deform the sheet metal therebetween.

4,558,583

MOBILE PIPE BENDING CARRIAGE

Robert A. Shaw, Sr., 2218 Holland St., West Columbia, S.C. 29169, and Robert A. Shaw, Jr., Rte. 6, Box 281, Lexington, S.C. 29071

Filed Feb. 7, 1984, Ser. No. 577,680
Int. Cl.[4] B21D *9/05*
U.S. Cl. 72—389 **1 Claim**



1. In combination with a conventional three-point bending frame having two opposing frame plates, each of said plates having at each of its opposite ends an aperture, said apertures being located proximate the lower edge of said frame plate,

a mobile pipe bending carriage, for storing and transporting bending equipment used in making radius bends in pipe, conduit, tubing and the like, which comprises:

a mobile carriage structure of welded frame construction having two opposed horizontal lower transverse frame members the ends of which are supported by large swivel-type casters for mobility, four opposed vertical support members, two transverse bracing members, and having

mounting attachment means for mounting thereon a conventional three-point bending frame assembly, comprising

two opposed bending frame mounting members each of which extends horizontally across the upper ends of two of said vertical support members, in parallel relationship with said transverse bracing member, the inner opposing vertical faces of said bending frame mounting members having a plurality of drilled and tapped holes aligned in to horizontal rows at regularly centered intervals, and

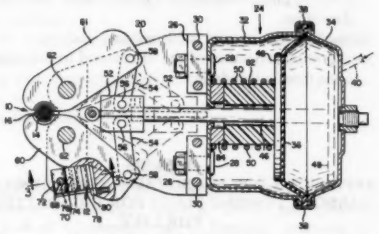
two hub plates, affixed to the inner opposing vertical faces of said bending frame mounting members, each said hub plates comprising a cylindrical hub affixed perpendicularly to a plate having drilled through holes at its four corners which holes are arranged so as to align with said drilled and tapped holes provided along the inner opposing vertical faces of said bending frame mounting members, said cylindrical hub of each hub plate fitting into said apertures on said frame plates for supporting said three-point bending frame upon said mobile carriage.

4,558,584

COMBINATION CABLE CRIMPER AND CUTTER

Robert W. Myers, Portland, Oreg., assignor to Paul Brong Machine Works, Inc., Portland, Oreg.

Continuation of Ser. No. 474,825, Mar. 14, 1983, abandoned.
This application Jan. 16, 1985, Ser. No. 691,733
Int. Cl.[4] B21D *7/00, 41/04*
U.S. Cl. 72—407 **3 Claims**



1. A combination cable crimper and cutter comprising:

(a) a frame having front and rear ends and opposite lateral sides,

(b) a piston mounted on the frame for reciprocating axial movement in the direction of the front and rear ends of the frame,

(c) pneumatically actuated diaphragm drive means mounted on the rear end of the frame and attached to the rear end of the piston for moving the piston and the diaphragm toward the front of the frame for cable crimping and cutting operations and retracting the, piston and diaphragm in the opposite direction,

(d) a pair of links pivotally connected at their inner ends to the front end of the piston,

(e) a pair of cable-crimping jaws pivotally mounted intermediate their ends to the frame adjacent the front end of the frame and diverging rearwardly, terminating at their rear ends forwardly of the drive means and the rear end of the frame,

(f) pivotal connecting means interconnecting the outer ends of the pair of links and the rear ends of the jaws for oscillating the jaws between open and closed position, the range of reciprocation of the piston by the drive means limiting the movement of the pivotal connecting means toward each other to a distance greater than the distance between the pivot mountings of the jaws on the frame,

(g) a cutter anvil mounted on the side of the frame adjacent one of the jaws, and

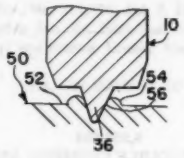
(h) cable cutting means mounted on said one of the jaws rearwardly of and in cable-cutting relation to the anvil for movement toward the anvil during movement of the jaw laterally outward relative to the frame.

4,558,585

ULTRASONIC ANGLE BEAM STANDARD REFLECTOR

Robert F. Berry, Jr., Hayes, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1984, Ser. No. 590,921
Int. Cl.[4] G01N *29/04*; G01D *18/00*
U.S. Cl. 73—1 DV 11 Claims



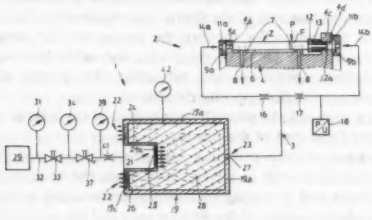
1. A method of inspecting critically stressed components by ultrasound comprising:
providing an item to be inspected having a surface capable of being impressed;
engaging the surface with a die stamp;
impressing the surface with the die stamp in such a manner that the impression exactly conforms to the taper of said die stamp;
subjecting the impress to ultrasound; and
interpreting reflection of the ultrasound to determine variations from a standard.

4,558,586

APPARATUS FOR STABILIZING THE PRESSURE OF GASEOUS TESTING FLUID FOR CIGARETTES AND THE LIKE

Uwe Heitmann, and Heidi Müller, both of Hamburg, Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,275
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300598
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 15 Claims



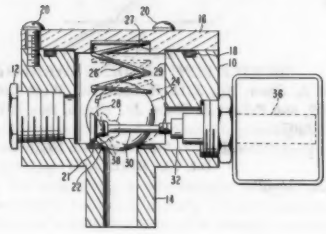
1. Apparatus for stabilizing the pressure of a gaseous testing fluid which is supplied to a testing device for rod-shaped articles of the tobacco processing industry wherein each testing operation involves the consumption of a first quantity of testing fluid, comprising a vessel arranged to store a second quantity of testing fluid which is a multiple of said first quantity, said vessel having an inlet and first and second outlets and the cross-sectional area of said second outlet being a multiple of the cross-sectional area of said first outlet; first conduit means connecting said first outlet with the testing device; a source of testing fluid; and second conduit means connecting said source with said inlet.

4,558,587

BALL-TYPE VACUUM VALVE FOR LEAK DETECTION APPARATUS

Paul R. Fruzzetti, N. Easton, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 29, 1984, Ser. No. 645,473
Int. Cl.[4] G01M *3/20*; F16K *31/06*
U.S. Cl. 73—40.7 9 Claims

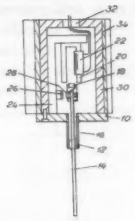


1. Apparatus for leak detection comprising:
a test port adapted for receiving a trace gas from a subject being tested;
a gas analysis instrument tuned to detect said trace gas and having an inlet for receiving said trace gas;
a first vacuum pumping means characterized by a relatively high reverse diffusion rate for light gases and a relatively low reverse diffusion rate for heavy gases, said first vacuum pumping means having a pump inlet coupled to said inlet of said gas analysis instrument, and a foreline;
a second vacuum pumping means coupled between said test port and said foreline of said first vacuum pumping means;
two valves for isolating said first vacuum pumping means coupled respectively to said inlet and said foreline of said first vacuum pumping means, each said valve including a valve housing having a high pressure inlet and low pressure outlet, an annular means for sealing inside said low pressure outlet, a smooth hard sphere of size sufficient to close said low pressure outlet when held against said annular sealing means, a coil spring for holding said sphere against said annular sealing means, and an actuator adapted and constructed to move said sphere away from said annular sealing means when said actuator is forced against said sphere;
said actuator being connected to a drive shaft adapted for movement along a path offset from and transverse to the axis of said coil spring, said actuator and said shaft being located on the same side of said annular sealing means as said sphere;
said actuator having a frustoconical surface positioned to contact the side of said sphere and oriented such that the small end of the frustoconical surface points in the valve-opening direction of movement along said path;
said valve housing having an inner wall surface against which said actuator slides during movement along said path; and
said drive shaft being driven by a solenoid so that in the event a power failure causes stoppage of said pumps, said two valves will automatically be closed by said spring and isolate said first pumping means.

4,558,588
VIBRATING NEEDLE VISCOSITY METER

Paul Beaudoin, Villemandeur, and Pierre Maronne, Chalette sur Loing, both of France, assignors to Societe Francaise de Services S.A., Villemandeur, France

Filed Apr. 9, 1984, Ser. No. 598,001
Claims priority, application France, Apr. 15, 1983, 83 06238
Int. Cl.[4] G01N *11/16*
U.S. Cl. 73—54 9 Claims

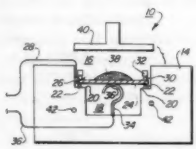


1. A viscosity meter for measuring the viscosity of a fluid comprising:
stationary base means,
a straight metal rod extending along a predetermined axis, having a first end portion adapted to be immersed in the fluid whose viscosity should be determined, a second end portion and an intermediate portion mechanically connected to said base means.
drive means for maintaining said metal rod in transversal oscillation, having stationary coil means operatively associated with said second end portion and having circuit means for energizing said coil,
and pick up means arranged to deliver an electrical signal representative of the amount of movement of said second end portion of said rod from a rest position,
wherein said circuit means are connected to receive said electrical signal and to energize said drive means at a frequency which is equal to the natural oscillation frequency of the rod and is varied depending upon the viscosity of the fluid.

4,558,589
ULTRASONIC COAGULATION MONITOR AND METHOD

Paul R. Hemmes, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 9, 1984, Ser. No. 659,173
Int. Cl.[4] G01N *33/48*
U.S. Cl. 73—64.1 29 Claims

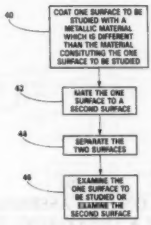


1. A ultrasonic coagulation monitor, comprising:
a housing,
at least one piezoelectric crystal mounted in said housing,
means for driving said crystal at a fixed frequency,
a timer, and
means for measuring resonant voltage in a circuit defined by said crystal and said driving means and for turning off said timer upon said voltage dropping to a predetermined level.

4,558,590
METHOD FOR MEASURING THE REAL CONTACT AREA IN CONNECTORS

Kishor V. Desai, Binghamton, and Roupen L. Keusseyan, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,752
Int. Cl.[4] G01B *21/28*
U.S. Cl. 73—104 14 Claims

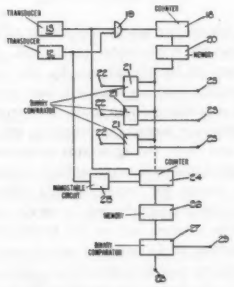

COAT ONE SURFACE TO BE STUDIED WITH A METALLIC MATERIAL WHICH IS DIFFERENT THAN THE MATERIAL CONSTITUTING THE ONE SURFACE TO BE STUDIED
MATE THE ONE SURFACE TO A SECOND SURFACE
SEPARATE THE TWO SURFACES
EXAMINE THE ONE SURFACE TO BE STUDIED OR EXAMINE THE SECOND SURFACE

1. A method of measuring the true contact surface area of a contact surface, comprising the steps of:
coating said contact surface with a metallic material which is different than the metallic material constituting said contact surface;
mating the coated contact surface with another contact surface;
separating said contact surface from said another contact surface; and
examining the contact surfaces.

4,558,591
ENGINE POSITION TRANSDUCER MEANS

John H. Francis, Cheltenham; Nigel A. Deller, and Clive I. Perkins, both of Cirencester, all of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Aug. 9, 1984, Ser. No. 639,146
Claims priority, application United Kingdom, Aug. 25, 1983, 8322886
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 4 Claims



1. A transducer means for providing an indication of the angular position of an engine crankshaft comprising a first disc and a first transducer associated therewith, said first disc being driven in use by the engine, a first series of means equal in number to the number of engine cylinders, on the disc whereby said first transducer produces signals at regular intervals during rotation of the engine, and a second series of means on the disc, the means of the second series being alternately arranged with the means of the first series, the angular intervals between

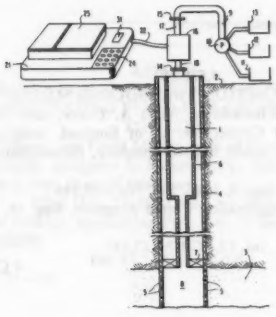
the means of the second series and the following means of the first series being unequal, a second disc and a second transducer associated therewith for producing signals at equal angular intervals during rotation of the engine, and signal processing means which receives said signals and compares the number of signals produced by said second transducer in the intervals between the signals provided by said first transducer, with a stored record to establish the position of the engine.

4,558,592

APPARATUS FOR ON-SITE ASSESSMENT OF THE EFFECTIVENESS OF A TREATMENT IN THE COURSE OF ITS APPLICATION TO A HYDROCARBON WELL

Damien M. Despax; Jean-Francois Brisou, both of Paris, and Michel F. Castellani, Longport, all of France, assignors to Compagnie Francaise des Petroles, France

Continuation-in-part of Ser. No. 446,309, Dec. 3, 1982, abandoned. This application May 14, 1984, Ser. No. 610,153
Claims priority, application France, Dec. 14, 1981, 81 23260
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **5 Claims**



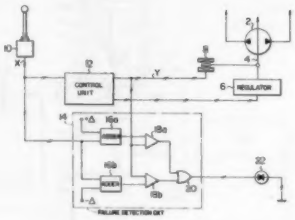
1. Apparatus for on-site assessment of the effectiveness of a treatment during its application to a well whose bottom reaches a stratum of hydrocarbons, by the introduction of fluids under pressure into an injection line connected at the surface to a pipe extending down to the bottom of the well and provided with detector means for detecting information relating to pressure and flow, the apparatus comprising a computing unit, connection means for connecting said computing unit to said detector means for receiving said information therefrom, a data acquisition unit adapted for receiving data relating to the well, to the stratum and to the treatment, connection means for connecting said computer unit to said data acquisition unit for receiving said data therefrom, said computing unit being capable of calculating the pressure P_F at the bottom of the well from said information and said data received thereby, a visual display unit, and connection means for connecting said visual display unit to said computing unit for receiving control instructions from said computing unit, said visual display unit being adapted to display at any moment a representative point defined by the pressure P_F at the bottom of the well, as calculated by said computing unit, and the flow Q in said injection line, as determined from information from at least one of said detector means.

4,558,593

FAILURE DETECTION SYSTEM FOR HYDRAULIC PUMPS

Hiroshi Watanabe, and Eiki Izumi, both of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,560
Claims priority, application Japan, Jul. 29, 1983, 58-137618; Jul. 29, 1983, 58-137619; Aug. 1, 1983, 58-139502
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 **7 Claims**



1. A failure detection system for hydraulic pumps each having displacement varying means, comprising:

displacement command generating means for generating a command value for causing the displacement varying means of one of the pumps to be displaced a predetermined amount;

sensor means for sensing the amount of a displacement of the displacement varying means of said one of the pumps;

comparator means in a failure detection circuit for comparing the absolute value of the difference between the command value generated by the displacement command generating means and an amount of the displacement sensed by the sensor means with a predetermined allowable value and for providing a signal indicating that the allowable value has been exceeded by the absolute value; and

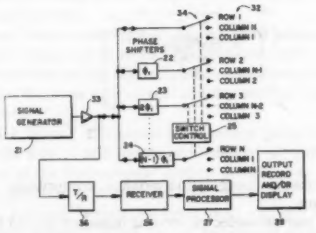
output means for outputting a failure signal for indicating that said one of the pumps is out of order when it is found by the comparator means that the allowable value has been exceeded by the absolute value.

4,558,594

PHASED ARRAY ACOUSTIC ANTENNA

Martin Balser, Encino, and Frank E. Ambler, Sepulveda, both of Calif., assignors to Xontech, Inc., Van Nuys, Calif.

Filed Jun. 25, 1984, Ser. No. 624,465
Int. Cl.[4] G01W *1/02*; G01S *9/66*
U.S. Cl. 73—189 **10 Claims**



1. In a system for remote measurement of wind velocity, the combination of:

an array of acoustic transducer elements providing for transmitting a beam of acoustic energy along a path and receiv-

ing such transmitted energy as scattered by wind in said path;

signal transmitting means including an electrical signal generator providing an electrical signal for driving said elements, and phase shifting means having said electrical signal as input and providing as output a shifted electrical signal;

first switching means for selectively connecting said signals to said elements for driving selected elements at predetermined phases to produce first, second and third beams in sequence at three different angles;

signal receiving means; and

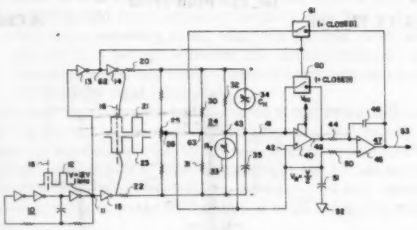
second switching means for connecting said elements to said signal receiving means.

4,558,595

CAPACITANCE MONITORING BRIDGE CIRCUIT FOR AN ENTHALPY RESPONSIVE DEVICE

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1985, Ser. No. 717,777
Int. Cl.[4] G01W *1/02*
U.S. Cl. 73—336 **7 Claims**



1. In a control circuit comprising

moisture responsive capacitance means having a capacitance which varies with the amount of humidity in the surrounding air,

bridge circuit means having an input power circuit and an output circuit for providing an output when said bridge circuit means is unbalanced,

means connecting said moisture responsive means in one branch of said bridge circuit,

bridge power supply means providing a pulsating DC voltage at a predetermined frequency and connected to said input power circuit,

amplifier circuit means having a reference input circuit,

integrator circuit means having an input circuit for receiving a pulsating signal and an output circuit providing a DC output voltage,

means connecting said output circuit of said bridge circuit to said input circuit of said integrator circuit means through said amplifier circuit means whereby said DC voltage is indicative of humidity,

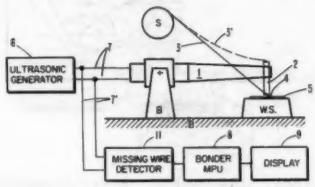
first feedback circuit means comprising switch means synchronized with said predetermined frequency connecting the DC output voltage of said integrator circuit means to said bridge circuit means for providing a voltage to balance said bridge circuit means.

4,558,596

APPARATUS FOR DETECTING MISSING WIRES

Michael McBrearty, Philadelphia, Pa.; Michael Negin, Cinnaminson, N.J.; I. Marvin Weilerstein, and Albert J. Zielenski, both of Philadelphia, Pa., assignors to Kulicke and Soffa Industries Inc., Horsham, Pa.

Filed Oct. 24, 1983, Ser. No. 544,874
Int. Cl.[4] G01M *7/00*; B23K *1/06*
U.S. Cl. 73—588 **8 Claims**



1. Apparatus for monitoring the bond condition of fine wire being ultrasonically bonded to a bonding pad comprising:

an ultrasonic transducer,

an ultrasonic generator coupled to said transducer,

a wedge bonding tool mounted in said transducer,

a fine wire threaded in said wedge bonding tool and having a wire tail positioned under the working face of said wedge bonding tool,

means for measuring and storing a plurality of frequency readings indicative of the frequency of said ultrasonic generator when said wedge bonding tool is wedge bonding said fine wire to said bonding pad, and

means for calculating a bond quality rating related to the frequency shift of said plurality of said frequency readings.

4,558,597

SURFACE TENSION SCREEN FAILURE DETECTION METHOD AND APPARATUS

James R. Fenwick, Chatsworth, and Yi M. Chang, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 688,853
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—600 **15 Claims**

1. A method for detecting failure of a gas barrier member, such as a surface tension screen, disposed between first and second chambers of a tank positioned in tandem relation along a longitudinal axis of the tank, said chambers being substantially filled by a liquid with respective first and second volumes of a gas contained in said liquid, said method comprising the steps of:

a. orienting said tank with its longitudinal axis disposed in a first predetermined position such that gas contained in said first chamber is placed against a first surface of said member;

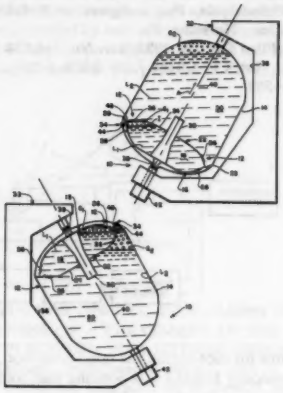
b. rotating said tank about its longitudinal axis such that said gas flows through any defect present in said member from said first to said second chamber;

c. making a first measurement indicative of the volume of said gas in said first chamber;

d. orienting said tank with its longitudinal axis disposed in a second predetermined position such that said gas in said second chamber is placed against a second surface of said member opposite said first surface;

e. rotating said tank about its longitudinal axis such that said gas flows through any detect present in said member from said second to said first chamber; and

f. making a second measurement indicative of the volume of said gas in said first chamber, whereby a comparison of



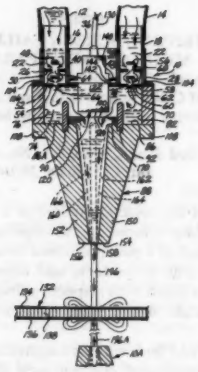
said measurements provides an assessment of the integrity of said member.

4,558,598

ULTRASONIC LINEAR ARRAY WATER NOZZLE AND METHOD

Fred D. Young, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 7, 1984, Ser. No. 618,227
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—644 **28 Claims**



1. An ultrasonic linear array water nozzle in which water is employed to couple ultrasonic energy between linear array transducers and a workpiece under inspection, comprising:

linear array ultrasonic transducers in said nozzle;

an upstream plenum chamber for receiving water upstream within said nozzle and associated with said transducers to distribute water along the length of the nozzle and the linear length of the array of transducers;

a water path in said nozzle from said plenum chamber and immediately downstream of said transducers so ultrasonic energy from the transducers is coupled with the water;

a main body in the nozzle downstream of the transducers and forming a downstream water path from the transducers to a discharge end of the nozzle;

said main body in the nozzle having a linear length extending at least the extent of the linear array of the transducers;

said main body downstream of the transducers having a wide opening adjacent the transducers, transverse to the linear length, and the opening forming a part of the downstream water path, and the water path narrowing transversely toward the discharge end to a narrow discharge opening, the discharge opening being substantially narrower transversely than the transducers and the wide opening, and extending along the linear length; and

waveguides extending in the main body from the wide opening adjacent the transducers to the narrow discharge end;

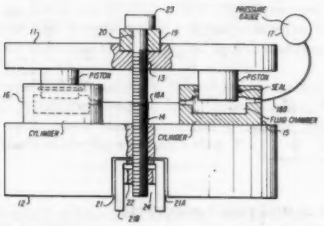
each waveguide being aligned with a respective transducer to receive the ultrasonic energy therefrom and each waveguide forming a part of the water path from the transducers to the discharge end.

4,558,599

BOLT DEMONSTRATOR

Neville W. Sachs, Liverpool, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 28, 1983, Ser. No. 489,293
Int. Cl.[4] F16B *31/02*
U.S. Cl. 73—761 **6 Claims**



1. A device for measuring the clamping force of a bolted nut assembly which comprises:

(a) a pair of adjacent retaining means in parallel alignment, each of said means having at least one passage therethrough, and at least one of said passages in one of said retaining means being in substantial axial alignment with at least one of said passages in the other retaining means;

(b) means for driving said retaining means in compressive relationship; a bolt passing through the passage in each of the retaining means and secured to a nut;

(c) pressure sensing means positioned between said retaining means for sensing pressure generated by compression of said retaining means;

(d) means for maintaining said retaining means, compression driving means and sensing means in operable relation;

(e) anti-friction means in which said bolt is mounted to allow substantially non-friction rotation of the bolt during bolt tightening of said retaining means;

(f) locking means mounted contiguous to said nut for locking said nut of said nut and bolt assembly during compression of said retaining means; and

(g) pressure measuring means for measuring said pressure sensed by said pressure sensing means.

4,558,600
FORCE TRANSDUCER

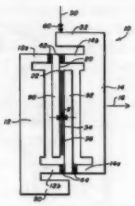
Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 359,619, Mar. 18, 1982, Pat. No. 4,463,614, which is a continuation-in-part of Ser. No. 265,087, May 19, 1981, Pat. No. 4,448,085. This application May 13, 1983, Ser. No. 494,450

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.⁴ G01L *1/14*

U.S. Cl. 73—862.64 **31 Claims**



1. A force transducer comprising:

A. a pair of opposed, rigid force summing members arrayed along a central axis,

B. a pair of sensor members extending toward one another and including mutually opposing, spaced apart sensing portions, and

C. first and second beam members disposed on opposing sides of and extending parallel to said central axis and coupling said force summing members, said first and second beam members being relatively flexible about axes parallel to a second reference axis perpendicular to said central axis, and said first and second beam members being substantially rigid otherwise,

said sensor members each being secured at one end to different ones of said first and second beam members and each extending generally at an angle of 0° to 90° with respect to a first reference axis perpendicular to said central axis and to said second reference axis, whereby relative movement of said sensing portions is related to the forces applied to said summing members,

D. an electrically conductive member on each of said sensing portions, said conductive members providing opposed, substantially parallel surfaces, whereby the capacitance associated with the conductive members is related to the forces applied to said summing members,

wherein said first and second beam members undergo a generally S-shaped deflection in response to an applied force that deflects one of said force summing members with respect to the other force summing member thereby causing a corresponding change in the spacing of said conductive members carried on said sensor members and whereby said relative movement of said force summing members is generally parallel.

4,558,601
DIGITAL INDICATING TORQUE WRENCH

Jan S. Stasiek, Atlanta, Ga., and Ira Deyhimy, Thousand Oaks, Calif., assignors to J. S. Technology, Inc., Alpharetta, Ga.

Filed Jan. 6, 1984, Ser. No. 568,782

Int. Cl.⁴ B25B *23/142*

U.S. Cl. 73—862.23 **33 Claims**

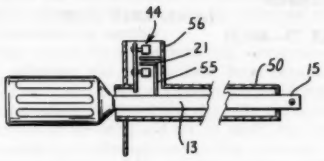
1. An indicating torque wrench, comprising:

a handle;

means for converting a force applied to said handle into a torque applied to a workpiece;

displacement means including a fixed portion and a movable portion responsive to move a predetermined distance with respect to said fixed portion upon the application of a predetermined force to said handle;

optical encoder displacement measuring means responsive to movement between said fixed portion and said movable portion of said displacement means for providing a plurality of digital displacement signals related to said predetermined distance, each one of said digital displacement signals representing a predetermined incremental amount



of displacement between said fixed portion and said movable portion of said displacement means;

computing means responsive to said digital displacement signals for converting said displacement signals into a torque signal having a magnitude related to the amount of torque applied to the workpiece; and

digital display means for displaying a visual representation of said torque signal.

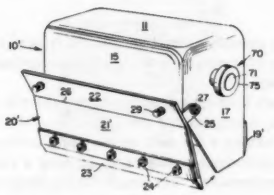
4,558,602
LARGE CAPACITY SAMPLE BUCKET AND BUCKET SAMPLER HAVING LOW CLEARANCE

James A. Redding, 615 Washington Rd., Pittsburgh, Pa. 15228

Filed Jun. 26, 1984, Ser. No. 624,827

Int. Cl.⁴ G01N *1/20*

U.S. Cl. 73—863.53 **24 Claims**



1. A sample bucket for cutting through a flow of material and selectively extracting a gross sample therefrom in accordance with movement of a conveyor means, said bucket comprising:

A. four walls and a bottom which are mutually attached to form a receptacle having an open mouth and a depth, one said wall being of less extent out from the bottom than the other three walls and is hereinafter called a partial wall, the depth being defined by the extent of the other three walls, said partial wall therefor extending only over a portion of said depth; and

B. a hinged closure means which:

(1) acts entirely by gravity,

(2) extends beyond the top edge of said partial wall, the top edge being the edge of said partial wall that is opposite to the edge thereof that is adjacent to the bottom of the receptacle,

(3) selectively closes to restrict the size of said mouth while said sample bucket is in said upright position, and

(4) selectively opens to enlarge said mouth while said sample bucket is in said inverted position.

4,558,603

NEEDLE ASSEMBLY FOR INTRODUCING A CARRIER GAS INTO A SAMPLE VESSEL

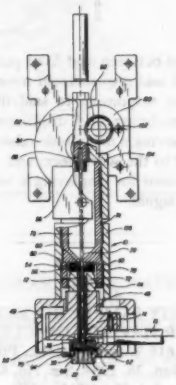
Wolfgang Chlosta, Uberlingen, and Wolfgang Riegger, Salem, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,673

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302158

Int. Cl.[4] G01N *35/06*

U.S. Cl. 73—864.21 17 Claims



1. Needle assembly useful as a sampling device in gas chromatography operating with the head space method; said assembly comprises:

a stationary housing having a chamber therein; said chamber defining a longitudinal passage;

a needle having a tip; said needle being sealingly guided in said longitudinal passage and defining a narrow annular gap therebetween, said longitudinal passage having a first end proximate said tip of said needle and a second end distal therefrom; said needle having a first lateral opening proximate said tip and a second lateral opening distal therefrom;

a pair of seals proximate said end of said longitudinal passage, said seals being spaced apart and closely engaging said needle;

a separate seal proximate said second end of said longitudinal passage and closely engaging said needle;

a first port communicating with a carrier gas conduit and terminating at said chamber between said pair of seals and said separate seal, said conduit being adapted to be shut off; said port being switchably connectable with a separating column; and

a servomotor for moving said needle between a position of rest and an operating position relative to said stationary housing whereby at said position of rest said first lateral opening is between said pair of seals and whereby at said operating position said needle, tip and said first lateral opening extend out of said housing and said second lateral opening is in gaseous communication with said first port whereby a carrier gas can pass through said second opening into said needle and out of said first lateral opening.

4,558,604

DIRECTIONAL GYRO

Werner Auer, Wiesenbach, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

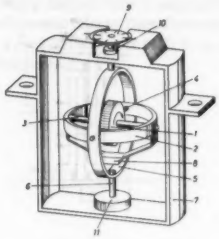
PCT No. PCT/EP82/00012, § 371 Date Sep. 22, 1982, § 102(e) Date Sep. 22, 1982, PCT Pub. No. WO82/02766, PCT Pub. Date Aug. 19, 1982

PCT Filed Jan. 23, 1982, Ser. No. 425,083

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1981, 3103467

Int. Cl.[4] G01C *19/30, 19/34*

U.S. Cl. 74—5.44 8 Claims



1. Directional gyro comprising:

a frame;

a first gimbal having a vertical axis and being mounted in said frame for rotation about said vertical axis;

a second gimbal having a precession axis which is perpendicular to said vertical axis and being mounted in said first gimbal for pivoting about said precession axis;

a gyro motor including a rotor having a spin axis, said gyro motor being mounted in said second gimbal with said spin axis being perpendicular to said precession axis;

a pickup means operatively associated with a said first gimbal for indicating an angle of rotation of said first gimbal relative to said frame; and

verticality means including a first means for displacing the center of gravity of said second gimbal to below said precession axis and a second means for damping the rotation of said first gimbal about said vertical said first and second means cooperating with each other to place said spin axis in a horizontal orientation.

4,558,605

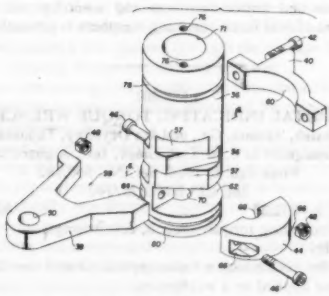
VALVE ACTUATOR COUPLING

Douglas J. Tanner, Rice, Minn., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 11, 1983, Ser. No. 474,490

Int. Cl.[4] F16H *21/44;* B25G *3/00;* F16D *1/00*

U.S. Cl. 74—102 9 Claims



1. A valve actuator comprising:

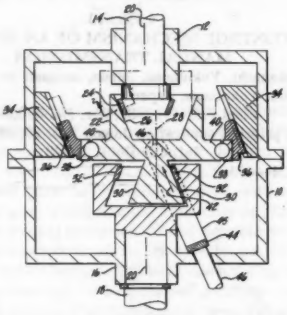
an actuator housing;
a coupling shaft means rotatably mounted in said housing;
receiving means at one end of said coupling shaft means for receiving a valve shaft to be controlled by the actuator;
a circumferial recess in said coupling shaft means bound by opposed surfaces displaced from the ends of said coupling shaft means and defining a wedge shaped cross-section of said coupling shaft means in said circumferial recess;
an arm means in said circumferial recess and extending in a plane perpendicular to said coupling shaft means and including a first member having a wedge shaped radial recess and engaging a substantial portion of said wedge shaped cross-section of said coupling shaft means and a second member engaging the remaining portion of said wedge shaped cross-section of said coupling shaft means;
adjustment means adjustably interconnecting said first and second members for adjusting the size of said wedge shaped aperture and securing said arm means to said coupling shaft means; and
force producing means connected to said first member of said arm means for controlling the position of a valve by rotating said coupling shaft.

4,558,606

VARIABLE SPEED DRIVE

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1983, Ser. No. 519,876
Int. Cl.⁴ F16H *15/16*
U.S. Cl. 74—193 **1 Claim**



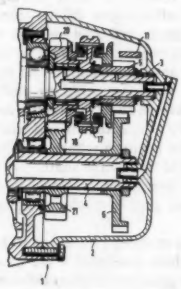
1. A variable speed drive comprising a rotary drive shaft and a rotary driven shaft axially spaced from one another on a common rotational axis; an intermediate floating force-transmitting member arranged between the drive shaft and driven shaft for selective rotation on a plurality of axes that are parallel to the first mentioned axis;
a first male conical drive element carried on one of said shafts, and a first female conical drive element carried on the intermediate force-transmitting member in frictional engagement with the first male element;
a second female conical drive element carried on the other shaft, and a second male conical drive element carried on the intermediate force-transmitting member in frictional engagement with the second female element;
the first female element and second male element being located on opposite faces of the force-transmitting member in axial alignment with one another for operative engagement with different ones of the conical elements carried by the axially spaced shafts; the conical elements having the same cone angle;
means floatably supporting the force-transmitting member, said support means comprising stationary guide means (34) having a guide direction that is parallel to the profile angle of the conical drive elements; said support means further comprising an annular ring (38) oriented in a plane normal to the common rotational axis of the drive and driven shafts, and slide elements (36) carried on said ring in slidable engagement with the stationary guide means whereby said ring can be adjusted in a direction parallel to the profile angle of the conical drive elements while maintaining its plane normal to the shaft axis; said force-transmitting member being concentrically arranged on said annular ring for rotation around the ring axis, such that adjustment of the ring parallel to the profile angle of the conical drive elements serves to vary the rotational axis of the force-transmitting member;
and adjusting means connected with the aforementioned ring for adjusting the intermediate force-transmitting member to or from a position wherein the rotational axis of the intermediate member coincides with the common rotational axis of the drive and driven shafts; the conical drive elements being dimensioned so that when the rotational axis of the intermediate member coincides with the common rotational axis of the drive and driven shafts the male drive elements have continuous three hundred sixty degree engagement with the female drive elements.

4,558,607

GEAR-TYPE CHANGE-SPEED TRANSMISSION FOR MOTOR VEHICLES

Imre Szodfridt, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Stuttgart, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,806
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244042
Int. Cl.⁴ F16H *3/38*
U.S. Cl. 74—339 **15 Claims**



1. A gear-type change-speed transmission for motor vehicles, comprising an input shaft and an output shaft which are supported in parallel to one another within a transmission housing means, and several pairs of gears in meshing engagement with each other for the engagement of a corresponding number of forward speeds as well as a further pair of gears for the engagement of a reverse speed, characterized in that said further pair of gears consists of a loose gear freely rotatably supported on the input shaft and operable to be connected therewith by a clutch means and of a fixed gear of the output shaft non-rotatably connected therewith, and in that an intermediate gear is provided between the loose gear and the fixed gear, said intermediate gear being longitudinally displaceable by a pivot lever means and being in continuous meshing engagement with the loose gear in one end pivot position, said intermediate gear being operable to be brought into meshing engagement with the fixed gear over a partial area of its tooth width during initiation of the shifting movement of the reverse speed and during engagement of the clutch means is brought into engagement with the fixed gear over the full tooth width before the clutching operation is terminated and the loose gear

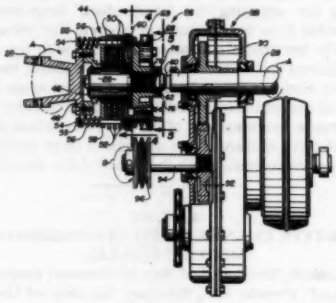
is operatively connected with the input shaft in a torque-transmitting manner.

4,558,608

CUTTERHEAD REVERSING DRIVE FOR FORAGE HARVESTERS

Curtis H. Lindblom, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1982, Ser. No. 452,003
Int. Cl.[4] F16H *3/14*
U.S. Cl. 74—376 **5 Claims**



1. In a forage harvester having a cutterhead, drive means for driving said cutterhead in a forward direction and in a reverse direction, said drive means comprising:

(a) an input drive shaft;

(b) a first transverse shaft connected to said input drive shaft;

(c) a second transverse shaft having means at one end thereof for effecting a driven connection to said first transverse shaft, and said second transverse shaft connected at the other end thereof to said cutterhead;

(d) said means at said one end of said second transverse shaft including a hub connected to and movable along said second transverse shaft between a driving position where it is drivingly connected to said first transverse shaft and a non-driving position where it is drivingly disconnected from said first transverse shaft;

(e) a first spur gear fixed to said second transverse shaft and a second spur gear in meshing engagement with said first spur gear;

(f) a first drive member connected to be driven by said first transverse shaft, a second drive member secured to said second spur gear, and a third drive member for making a driving connection between said first and second drive members;

(g) means carried by said hub for preventing said third drive member from making a driving connection between said first and second drive members when said hub in said driving position.

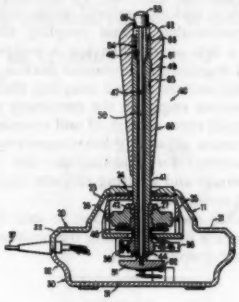
4,558,609

JOYSTICK CONTROLLER WITH INTERCHANGEABLE HANDLES

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Jan. 6, 1983, Ser. No. 456,261
Int. Cl.[4] G05G *9/00*
U.S. Cl. 74—471 XY **8 Claims**

1. In a joystick controller including a housing, an elongated hollow tubular shaft tiltably carried by the housing and having an outer surface and an elongated rod disposed in the shaft coaxially therewith and spaced radially therefrom and projecting therefrom for reciprocating movement with respect thereto, the improvement comprising: handle mounting means on the shaft, and removable handle means having a top end and having a bore therethrough defining a cylindrical inner surface telescopically received over one end of the shaft, said inner surface being dimensioned for frictional engagement with said handle mounting means to hold said handle means in an assembled condition on the shaft while accommodating movement of said handle means to and from the assembled condition



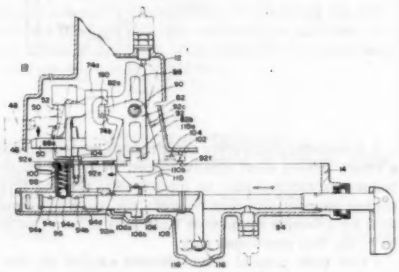
thereof without affecting the rod, the shaft having an enlarged-inner-diameter counterbore at said one end thereof, and a helical compression spring disposed in said counterbore and engageable with the rod for resiliently urging the rod to a normal rest position projecting a predetermined distance from said one end of said shaft.

4,558,610

SHIFT CONTROL MECHANISM OF AN AUTOMOTIVE MANUAL TRANSMISSION

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 19, 1982, Ser. No. 350,392
Claims priority, application Japan, Feb. 20, 1981, 56-24765
Int. Cl.[4] B60K *20/00*
U.S. Cl. 74—473 R **7 Claims**



1. A shift control mechanism of an automative manual transmission comprising a plurality of shift forks each having a recess formed within an extension thereof, a plurality of pivoting levers spaced closely adjacent each other and pivotable about a common axis, a first end of each pivoting lever being received in the recess of the associated shift fork extension so as to establish an articulated connection therebetween so that upon rotation of one pivoting lever about the common axis, the corresponding shift fork shifts to establish a certain transmission gear ratio; means selectively engageable with a second end of each pivoting lever for pivotally moving the selected pivoting lever about the common axis; and further including a wear-resistant cap member mounted on said first end of each pivoting lever so as to be slidably movable relative to said first end to reduce friction therebetween, said cap member mounted on

said first end being received in said recess of the corresponding shift fork extension so that said cap is slightly moveable relative to surfaces of said recess to reduce friction therebetween.

4,558,611

ANGULAR DIVIDER DEVICE FOR WORKTABLES, TOOLHOLDER TURRETS OR THE LIKE

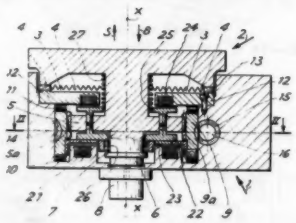
Pier C. Boffelli, San Donato Milanese, Italy, assignor to Baruffaldi Frizioni S.p.A., San Donato Milanese, Italy

Filed Jul. 9, 1982, Ser. No. 396,868

Claims priority, application Italy, Jul. 22, 1981, 23071 A/81

Int. Cl.⁴ B23B *29/32*; B23Q *17/00*

U.S. Cl. 74—826 **10 Claims**



6. Angular divider device for worktables, toolholder turrets or the like, comprising a fixed part in the form of a fixed base, upon which a worktable, toolholder or the like forming a movable part which can rotate and move in axial translatory movement, said parts being equipped each with a toothed coaxial crown gear wheel adapted to be inserted the one into the other with an axial movement of said movable part, in such a manner as to block or to release the movable part in rotation, said axial movement being determined, when the movable part is rotationally blocked, by a screw-nut coupling, one of the parts of which is integral with said movable part and the other part of which is integral with a coaxial rotary element, which can rotate but not execute translatory movement, actuated by a single motor of any appropriate type, whereas the angular displacement movement of said movable part is effected by the same rotary element, actuated by said motor, with contemporaneous entraining of the screw and of the nut connected the one to the other, said blocking and said entraining being effected respectively by means of a brake disposed between said movable part and the fixed part, and a clutch disposed between said rotary element and said movable part, the angular prepositioning of the movable part being effected by means of an angular measuring device associated with the movable part and adapted for arresting the angular displacement movement within the interval between one tooth and another of said crown gear wheels, for permitting the succeeding exact positioning and blocking on the carrying out of said axial movement of said movable part, achieved by said single motor and by the arresting of the movable part effected by said brake, said brake and said clutch being of electromagnetic type, in which the electromagnet with winding and electrical connections, is integral with the fixed base, while an associated armature is rotationally integral with the movable part, through the agency of means which permit said armature to also have the axial closure movement.

4,558,612

VEHICULAR AUTOMATIC SPEED CHANGE GEAR ASSEMBLY

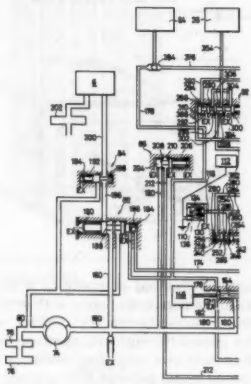
Takeo Shimizu; Takeo Hiramatsu; Bonnosuke Takamiya, and Hiroshi Fukuchi, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

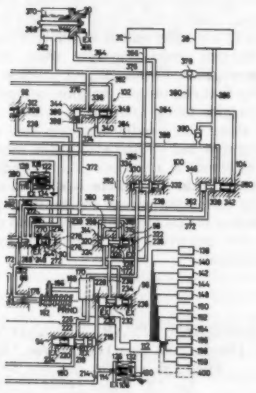
Filed Nov. 30, 1982, Ser. No. 445,617

Claims priority, application Japan, Nov. 30, 1981, 56-192606; Nov. 30, 1981, 56-192607

Int. Cl.⁴ B60K *41/18, 41/16*

U.S. Cl. 74—844 **11 Claims**





1. An automatic speed change gear assembly for a vehicle, comprising:

advancement direction indicating switch means having at least two settings, said switch means being manually operable to indicate forward movement at one of said two settings and backward movement at another setting;

a vehicle stop sensor for detecting when said vehicle is stopped;

operating condition change-over means for providing one of forward, backward and neutral operating conditions in response to forward, backward and neutral control signals, respectively; and

control means responsive to said advancement direction indicating switch and said vehicle stop sensor for providing said neutral control signal when said advancement direction indicating switch means is switched from a

forward movement indication to a backward movement indication and said vehicle stop sensor indicates that said vehicle is not stopped, and thereafter for automatically providing said backward control signal when said vehicle stop sensor indicates that said vehicle has stopped.

4,558,613

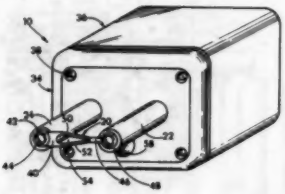
THERMAL WIRE STRIPPER

Tony Nespor, 2515 Glencoe Rd., Baltimore, Md. 21234

Filed Jun. 25, 1984, Ser. No. 624,241

Int. Cl.[4] H02G *1/12*

U.S. Cl. 81—9.4 **8 Claims**



1. A system for thermal stripping of a length of insulated wire, comprising: a conductive strip with structure defining an aperture therein proportioned for contact with a length of insulated wire passed through said aperture, means for heating the conductive strip and removing insulation from a length of insulated wire on a said passage through said aperture, means providing for gripping of insulation of insulated wire, within a range of sizes of insulated wire, at said aperture, comprising: said structure including first and second margins, said first and second margins converging and defining a shape for said aperture tapered from a larger end for freely receiving said insulated wire to a smaller end at which said converging first and second margins wedge between them and grip insulation passed thereagainst, means causing uniform heating along said converging first and second margins, comprising: said first and second margins being uniform in width, and longitudinally disposed along said conductive strip, said means for heating comprising first and second electrodes, means for connecting said first electrode at a first end of said conductive strip, means for connecting said second electrode at a second end of said conductive strip, and means for tensioning said conductive strip including means for biasing apart said means for connecting said first electrode and said means for connecting said second electrode.

4,558,614

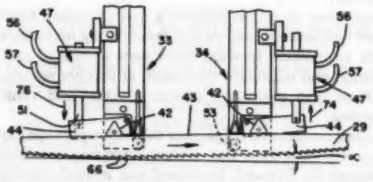
BAND SAW APPARATUS AND METHOD

Gerald R. Harris, P.O. Box 1148, Pryor, Okla. 74361

Filed Feb. 6, 1984, Ser. No. 577,527

Int. Cl.[4] B23D *53/04, 53/08*

U.S. Cl. 83—56 **11 Claims**



1. A method of cutting a workpiece with a band saw or the like having carriage means movably mounted or advancement of said saw blade toward said workpiece to effect cutting, including the steps of moving a cutting stretch of a saw blade between two blade support assemblies carried by said carriage means across said workpiece to effect cutting, and simultaneously and periodically varying the force per unit area of said saw blade against said workpiece, wherein the improvement in said method of cutting is comprised of:

said varying step is accomplished by displacing a portion of both of said blade support assemblies in opposed directions relative to said carriage means to periodically tilt said cutting stretch relative to said carriage means between said support assemblies to reduce the area of said workpiece engaged by said cutting stretch and increase the force per unit area.

4,558,615

METHOD FOR THE MANUFACTURE OF FRESHLY PRINTED SECURITY PAPERS CUT TO FORMAT AND AUTOMATIC CUTTING MACHINE FOR CARRYING OUT THE METHOD

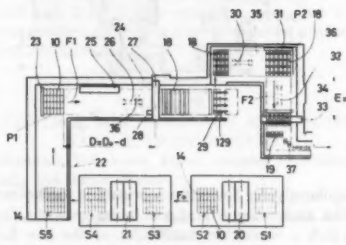
Runwalt Kuchfuss, Metzingen, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Switzerland

Filed Mar. 29, 1983, Ser. No. 481,332

Claims priority, application Switzerland, Apr. 8, 1982, 2194/82

Int. Cl.[4] B26D *5/00*

U.S. Cl. 83—74 **19 Claims**



1. A method for manufacture of freshly printed security papers cut to format comprising the steps of:

printing security papers with a printing unit having a printing plate the printing step comprising printing a plurality of security paper units onto a sheet, the security paper units being arranged in the form of a matrix and wherein the sheets of security papers are laid on one another to form piles of sheets;

evaluating increasing expansion of the printing plate during the printing operation;

evaluating length of the feed movements, in a first direction, of a pile of printed sheets between a given initial position of a pile and a position in which trimming of the front edge of said pile takes place;

feeding a pile of sheets in a step-wise manner to a first cutter;

adjusting the length of the feed movements in the first direction for each cut in accordance with the increasing expansion of the printing plate in order to approximately maintain exact centering of the printed image with respect to the edge of the security paper;

cutting the pile of sheets in the first direction to form a plurality of piles of strips;

evaluating length of feed movement, in a second direction;

whereby the feed length is changing with the increasing number of prints such that centering of the print image with respect to the edge of the security paper is approximately maintained;

feeding at least one pile of strips in a step-wise manner to a second cutter;

adjusting the length of the feed movements in the second direction for each cut in accordance with the increasing expansion of the printing plate in order to approximately

maintain exact centering of the printed image with respect to the cut edge of the security paper;

cutting the pile of strips in a second direction to form a plurality of bundles of security papers.

4,558,616

PUNCH PRESS HAVING RETRACTABLE PUNCHING TOOLS

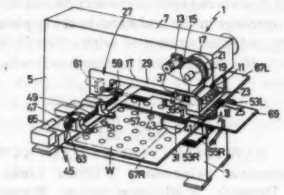
Katsuyoshi Sakamoto, Isehara, Japan, assignor to Amada Company, Limited, Japan

Filed Nov. 3, 1983, Ser. No. 548,417

Claims priority, application Japan, Nov. 5, 1982, 57-193397

Int. Cl.⁴ B26F 1/14

U.S. Cl. 83—399 **4 Claims**



1. A punch press, comprising:

an upper punching tool and a corresponding lower punching tool to punch a workpiece;

workpiece positioning means to move and position the workpiece;

a lower punching tool holder having a planar lower surface arranged obliquely with respect to the top surface of the lower punching tool;

a slide base fixed to such punch press having an upper planar surface arranged parallel with the planar lower surface of the lower punching tool holder; and

means for temporarily sliding the lower punching tool holder along the upper planar surface of the slide base so as to obliquely lower the lower punching tool into an inactive position with respect to the workpiece positioning means.

4,558,617

DEVICE FOR CUTTING AN ELONGATE PAPER ROLL

Adrianus G. M. Boelen, Tilburg, Netherlands, assignor to Rolco International B.V., Tilburg, Netherlands

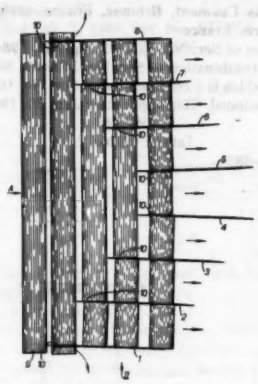
Filed Jan. 16, 1984, Ser. No. 570,961

Claims priority, application Netherlands, Jan. 22, 1983, 8300235

Int. Cl.⁴ B26D 1/03, 1/143

U.S. Cl. 83—425.1 **1 Claim**

1. A device for cutting an elongate paper roll into a plurality of small rolls, said device comprising a plurality of cutting discs adapted to rotate each about rotary axis which is in a fixed position during operation, means for displacing the elongate paper roll with respect to said cutting discs in a direction generally at right angles to the rotary axes of said cutting discs, said cutting discs being offset in the direction of displacement of the paper roll in a manner such that an outermost portion of the paper roll is substantially cut off before the next cutting disc cutting off the adjacent portion of the paper roll engages the paper roll, each of said cutting discs having two boundary faces, one of which is at right angles to the rotary axis of the cutting disc and the other of which is inclined at a narrow angle to a plane at right angles to the rotary axis of the cutting disc, said cutting disc being disposed so that the inclined boundary face is substantially at right angles to the longitudinal axis of the elongate paper roll at the level where the cutting disc engages the paper roll, and said inclined boundary face



faces away from the portion of the paper roll to be cut off by the cutting disc concerned.

4,558,618

ADJUSTABLE FENCE FOR A SAW TABLE OR THE LIKE

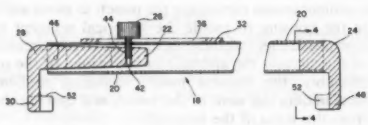
Rainer Bachmann, Hohenstein, and Hartmut van Hauten, Wiesbaden, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 22, 1984, Ser. No. 623,776

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 8318518[U]

Int. Cl.⁴ B26D 7/06

U.S. Cl. 83—438 **18 Claims**



1. An adjustable fence for a saw table or the like, comprising:

an elongate main fence member defining a longitudinal direction and having a first clamping portion at one end;

an auxiliary fence member pivoted to said main fence member about a pivotal axis at right angles to said longitudinal direction, said auxiliary fence member extending from another end of said main fence member and having a a second clamping portion spaced from said first clamping portion in said longitudinal direction;

means, connected between said main and auxiliary fence members and actuatable by one hand of an operator, for adjustably pivoting said auxiliary fence member relative to said main fence member to shorten the distance between said first and second clamping portions, whereby said first and second clamping portions can be clamped against opposite sides of said table with said main fence member extending over the surface of said table;

said means comprising a screw;

said screw being threadedly engaged in said auxiliary fence member and having a head which bears against said main fence member; and

said screw being at right angles to said pivotal axis and located between said pivotal axis and said one end of said main fence member.

4,558,619

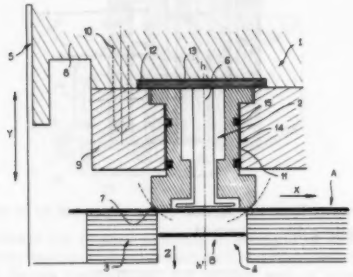
APPARATUS FOR CUTTING DISCS FROM A SHEET OF FLEXIBLE MATERIAL

Jean-Francois Caumont, Brionne, France, assignor to Tempo Sanys, Paris, France

Continuation of Ser. No. 581,501, Apr. 27, 1984, abandoned, which is a continuation of Ser. No. 362,469, Mar. 26, 1982, abandoned, which is a continuation of Ser. No. 163,705, Jun. 27, 1980, abandoned. This application Jan. 30, 1985, Ser. No. 696,860

Int. Cl.⁴ B26F *1/14*

U.S. Cl. 83—685 **1 Claim**



1. In apparatus for cutting discs from a sheet of flexible material where the apparatus is of the kind employing a punch cooperable with a die having a circular aperture, the improvement which allows the punch to adjust for misalignment with the circular die aperture, comprising

(i) a housing forming an assembly with the punch, the punch having a stem held in the housing in a manner causing the punch to be in substantial alignment with the die aperture, the punch having a protruding spherical segment adopted to bear against the circumference of the circular die aperture, the assembly being movable toward and away from the die aperture, and

(ii) resilient means permitting the punch to move sufficiently in the housing to enable the spherical segment to force interposed sheet meterial against the entire circumference of the circular die aperture in one stroke of the movable assembly, the resilient means including resilient rings surrounding the stem of the punch and spacing that stem from the walls of the housing.

4,558,620

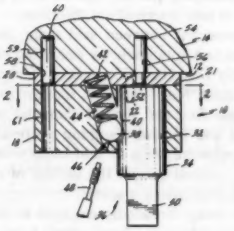
PUNCH RETAINER

Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Oct. 5, 1984, Ser. No. 658,211

Int. Cl.⁴ B26D *7/26*; B26F *1/14*

U.S. Cl. 83—698 **10 Claims**



1. A punch retainer comprising a body having a flat face, a first bore extending through said body perpendicular to said flat face, a backing plate secured to said flat face and overlying said bore, said backing plate being designed to abut a flat mounting face on a die shoe on which the retainer is adapted to be secured, means in said body for releasably retaining the shank of a punch in said bore with the inner end of the shank abutting said backing plate, said body also having second and third accurately sized bores therein spaced from said first bore, the ends of the second and third bores remote from said backing plate being counterbored, said backing plate having a first opening therethrough accurately aligned with the central axis of said first bore, a dowel having a close fit in said opening and adapted to have a close fit in a registering opening in the die shoe, said backing plate also having second and third accurately sized openings therethrough which are adapted to be aligned accurately concentric with the second and third bores in the body when the first opening in the backing plate is axially aligned accurately with the central axis of said first bore and tubular dowels engaged in the second and third registering bores and openings in the body and backing plate, said tubular dowels being adapted to receive with a free fit holding screws threaded into the die shoe and having heads which seat in said counterbores.

4,558,621

SAW CHAIN FOR A CHAIN SAW

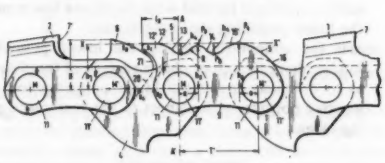
Karl Nitschmann, Schorndorf; Wilfried Linke, Winnenden; Günter Dietzsch, Waiblingen-Hohen; Werner Hartmann, Ostfildern; Hans-Georg Kaiser, Köngen; Werner Meyle, Murr, and Hans Dolata, Waiblingen-Neustadt, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,196

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326643

Int. Cl.⁴ B27B *33/14*

U.S. Cl. 83—834 **14 Claims**



1. A saw chain for a chain saw, the saw chain comprising:

a plurality of cutting links, a plurality of safety links, a plurality of side connecting links, and a plurality of driving links, the links being pivotally interconnected by rivets or the like to define the saw chain with a first portion of said cutting links and a first portion of said safety links being arranged on one side of the saw chain and the remaining portion of said cutting links and the remaining portion of said safety links being arranged on the other side of the saw chain;

each one of the cutting links including: a plate-like body having an upwardly extending rearward bent-over top portion defining the cutting tooth of the cutting link; a forward upwardly extending portion defining the depth limiter of the cutting link; and, said cutting tooth having a cutting edge at an elevation above said depth limiter;

said safety links corresponding to respective ones of said cutting links;

each one of said safety links being pivotally connected at its rearward end to the forward end of the cutting link corresponding thereto and being disposed on a side of the saw chain opposite from the side thereof on which said corresponding cutting link is disposed;

said safety link having a plate-like body with a projection extending outwardly and rearwardly therefrom so as to be

at an elevation less than the depth limiter of said corresponding cutting link;

said safety link further having a rearward rivet opening and a forward rivet opening for accommodating two of said rivets, respectively, said rivet openings having centers defining a first line, the highest point of the top edge of said projection being a predetermined elevation (h_1) away from said first line;

said safety link having a top edge extending over the length thereof, said top edge having a profile in the form of a continuous curve having two waves starting from the rearward projection and continuing forward through a first trough to a first crest, said first trough having a depth at its deepest point not deeper than 5/10 of said elevation (h_1), said first crest having a highest point at an elevation lower than said elevation (h_1);

said profile continuing from said first crest through a second trough to a second crest; and,

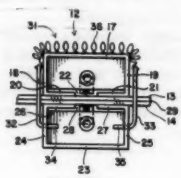
said second crest having a highest point lying in the front half of said safety member, said highest point of said second crest extending upwardly at most to a point on a second line (X–X′) parallel to said first line and touching said highest point of said top edge of said projection.

4,558,622

APPARATUS FOR CUTTING LAMINATED GLASS

Russell Tausheck, P.O. Box 4114, Oakland, Calif. 94614

Filed Nov. 4, 1983, Ser. No. 548,669
Int. Cl.⁴ B26D *3/08*
U.S. Cl. 83—885 **12 Claims**



1. Apparatus for simultaneously scoring both glass layers of a laminated glass pane having an intermediate layer of a plastic material adhesively sandwiched between the two glass layers, comprising:

(a) a first elongated member adapted to underlie said glass pane;

(b) a second elongated member adapted to overlie said first elongated member on the opposite side of said glass pane;

(c) means for binding said elongated members to each other on opposite sides of said glass pane; and

(d) means operatively associated with said elongated members movable therealong to simultaneously score opposite sides of said glass pane;

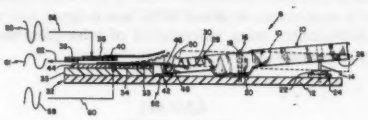
(e) said means for binding said elongated members to each other and to said glass pane including resilient bale means pivotally mounted adjacent opposite ends of one of said elongated members and selectively engageable with the corresponding end portion of the associated other elongated member to resiliently bias said elongated members toward each other when engaged whereby said glass pane is clamped between said elongated members.

4,558,623

VELOCITY AND AFTERTOUCH SENSITIVE KEYBOARD

Donald F. Buchla, Berkeley, Calif., assignor to Kimball International, Inc., Jasper, Ind.

Filed Feb. 7, 1984, Ser. No. 577,854
Int. Cl.⁴ G10H *1/34*
U.S. Cl. 84—1.1 **27 Claims**



1. A keyboard system in a keyboard controlled musical instrument comprising:

a pair of electrode members,

input means for impressing respective input voltages on said member to establish an electrical field between said electrode members, said electrical field having a voltage that changes as a function of distance from one of said electrode members,

a movable pickup means positioned in said field between and spaced from said electrode members, said pickup means having an output voltage impressed thereon by the electrical field that is a function of the closeness of said pickup means to said one electrode member,

a playing key depressible by a person playing the instrument,

means connecting said playing key to said pickup means to move said pickup means within said field toward or away from said one electrode member in accordance with the depression of the key, and

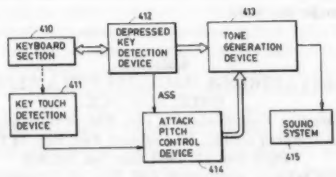
output means connected to said pickup means for sensing the output voltage impressed thereon and controlling the quality of a tone produced by the instrument in response to the sensed output voltage as the playing key is depressed.

4,558,624

EFFECT IMPARTING DEVICE IN AN ELECTRONIC MUSICAL INSTRUMENT

Norio Tomisawa, Hamamatsu, and Hideo Suzuki, Takatsuka, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 433,020, Oct. 6, 1982, abandoned. This application Jan. 17, 1985, Ser. No. 693,211
Claims priority, application Japan, Oct. 15, 1981, 56-163393
Int. Cl.⁴ G10H *1/02*
U.S. Cl. 84—1.26 **36 Claims**



1. An electronic musical instrument comprising:

keyboard means having a plurality of keys;

depressed key detection means connected to said keyboard means for detecting a depressed key;

tone generation means responsive to said depressed key detection means for generating a tone signal having a pitch corresponding to said depressed key;

touch detection means for detecting an initial key touch of said

depressed key as it is first depressed and for delivering an initial touch signal relating to said initial key touch; and

attack pitch control means, connected to said depressed key detection means, said tone generation means and said touch detection means, for automatically modulating the pitch of said tone signal during an attack pitch time interval starting from the beginning of sounding of the tone corresponding to said tone signal, and for establishing the initial pitch deviation of said pitch modulation during said attack pitch interval in accordance with said initial touch signal, said modulation thereafter being independent of subsequent depressed key movement.

4,558,625

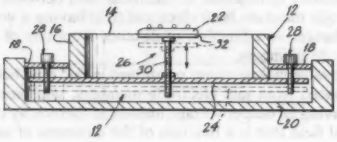
BANJO MUTE

Donald K. Guest, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jul. 23, 1984, Ser. No. 633,867

Int. Cl.⁴ G10D *3/04*

U.S. Cl. 84—273 **2 Claims**



1. A mute for a banjo having a parchment belly stretched over a hoop, a peripheral flange about said hoop, a resonator connected to said flange and a bridge on said parchment belly, said mute comprising:

(a) a platform spaced from said resonator;

(b) a supporting device adjustably carried by said platform and adapted to bear against said parchment belly under said bridge of said banjo; and

(c) means for adjusting said platform, said means carried by said flange, wherein said supporting device comprises:

(a) an upright threaded rod threaded into middle of said platform; and

(b) a lifter plate integral with upper end of said rod, said plate adapted to bear against inner surface of a portion of said parchment belly under said bridge of said banjo, wherein said means for adjusting said platform comprises a pair of thumbscrews, each thumbscrew having a head and shaft with a threaded portion, each said thumbscrew threaded into each end of said platform to move said lifter plate on said rod to change tone of said banjo from a soft regulated sound to a total muted sound wherein said lifter plate further comprises a resilient member to prevent slippage of said lifter plate from said inner surface of said parchment belly.

4,558,626

PRIMER CARTRIDGE MAGAZINE FOR A WEDGE-TYPE BREECH BLOCK

Rolf Bartolles, Korschenbroich, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,428

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233749

Int. Cl.⁴ F41F *13/12*

U.S. Cl. 89—24 **10 Claims**

1. In a gun having a wedge-type breech mechanism and a reciprocally movable slider, a primer cartridge magazine operatively movable in said slider, said primer magazine comprising in combination,

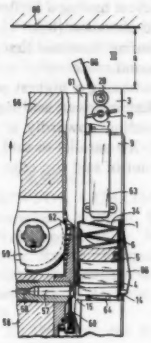
biasing means operatively mounted in said magazine for biasing a stack of primer cartridges stored therein;

said magazine has a pair of opposite parallel walls on which a stock primer cartridge indicia means is rotatably mounted;

a guide member is slidably movably mounted in said magazine between said pair of opposite parallel walls and is urged by said biasing means against said stack of primer cartridges;

a tension band has one of its ends connected to said guide member and the other end connected to said stock primer cartridge indicia means;

first releasable locking means operatively mounted in said magazine so as to selectively move between a locking first position and a second releasing position, said first locking means automatically releasing said stock primer cartridge



indicia means when being disposed in said second position and automatically locking said stock primer cartridge indicia means when being disposed in said first position, said first locking means assuming said second position when said magazine is in assembled state in said slider; whereby the stock of primer cartridges is continuously indicated in said magazine;

said biasing means including second releasable locking means for deactivating the biasing during loading of primer cartridges into said magazine;

said stock primer cartridge indicia means including a stop for preventing an overloading of said stock primer cartridge indicia means.

4,558,627

WEAPON CONTROL SYSTEM

James C. LeBlanc, and Richard S. LeBlanc, both of Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 437,855, Oct. 29, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,262

Int. Cl.⁴ F41G *5/02*

U.S. Cl. 89—41.03 **4 Claims**

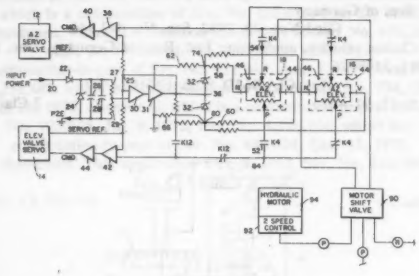
1. A system for controlling movement of a weapon comprising:

control means including a multispeed range fluid operated motor for effecting movement of the weapon and an electrically operated fluid servo positionable in relation to the magnitude and direction of electric current supplied thereto for supplying fluid to said motor to control the direction of speed of weapon movement;

demand means including a positionable potentiometer and amplifier means for supplying said servo with electric current of a magnitude and direction for bringing the position of the servo into correspondence with the position of the potentiometer;

manually operated means for adjusting the potentiometer between null and limit positions to control the speed and direction of weapon movement; and

motor speed range control means effective (1) when the potentiometer position is adjusted to a nonlimit position by said manually operated for engaging a first speed range of said motor to effect relatively slow movement of said



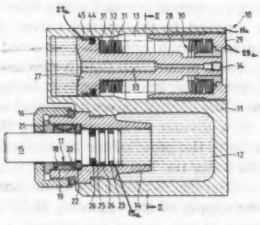
weapon, and (2) when the potentiometer position is adjusted to a limit position by said manually operated means for engaging a second speed range of said motor to effect relatively rapid movement of said weapon.

4,558,628

BREECHBLOCK BUFFER FOR AN AUTOMATIC FIRING WEAPON

Werner Bosshard, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Jun. 8, 1984, Ser. No. 619,564
Claims priority, application Switzerland, Jul. 5, 1983, 3681/83
Int. Cl.⁴ F41D *11/12*
U.S. Cl. 89—198 **5 Claims**



1. A breechblock buffer for an automatic firing weapon, comprising:

a buffer housing provided with two chambers therein;

said two chambers defining a first chamber and a second chamber;

a buffer piston arranged in said first chamber;

an elastic element arranged in said second chamber;

a check valve for flow communicating both of said first and second chambers with one another;

said check valve only opening in the direction of said first chamber;

said elastic element comprising a piston member displaceably arranged in the second chamber and loaded by a plate spring packet;

recoil buffer means located in the first chamber and cooperating with said buffer piston;

said recoil buffer means comprising a number of spring ring members;

two sealing rings and a guide ring provided for said buffer piston; and

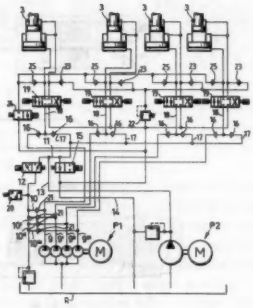
said guide ring being arranged between said two sealing rings.

4,558,629

HYDRAULIC CONTROL MEANS FOR PIPE THRUST-JACKING APPARATUS

Eberhart Unger, Lünen, and Herbert Heitkamp, Werne, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 560,078
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245728
Int. Cl.⁴ F15B *11/05*
U.S. Cl. 91—29 **4 Claims**



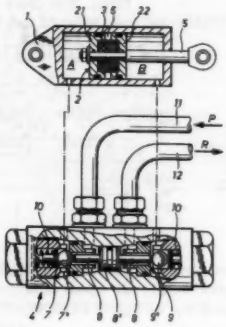
1. Hydraulic control means for controlling pipe thrust-jacking apparatus of the type having a pressure ring (5) which is advanceable by means of a plurality of hydraulic rams (3), said hydraulic control means comprising: a plurality of first hydraulic control valves (19), each of which is associated with a respective hydraulic ram, each first hydraulic control valve being connected to a first input line and to a second input line (17), wherein each of the first input lines is connected to a respective hydraulic fluid feed line (9–9'''), and each of the second input lines is connected to a common hydraulic fluid supply line (11) and to an auxiliary pump (P2), the common supply line being connected to all of the feed lines, wherein means (12, 15) are provided for selectively connecting each of the first hydraulic control valves to either its first input line or to both its first and second input lines, wherein each of the feed lines is supplied with pressurised hydraulic fluid at the same rate by a multi-flow main pump (P1) separate from and operable independently of the auxiliary pump, wherein each first hydraulic control valve is connected to its first input line and to its second input line by a common input line (18), wherein each of the first input lines and each of the second input lines is provided with a non-return valve (16), the non-return valves forming part of the selective connection means, and wherein the selective connection means further includes a second hydraulic control valve (12) positioned in the common supply line, whereby a pressure ring may be uniformly advanced and retracted at a relatively slow speed under no load conditions by actuating the rams with fluid from the main pump, and advanced at a relatively high speed and with increased force under load by actuating the rams with fluid from both the main and auxiliary pumps.

4,558,630

HYDRAULIC MECHANISM WITH ELASTICALLY BACKED PISTON PARTS AND COOPERATING VALVE MEANS

Matti Leppälä , Pirkkala, Finland, assignor to Oy Tampella Ab, Finland

PCT No. PCT/FI81/00040, § 371 Date Jan. 11, 1982, § 102(e) Date Jan. 11, 1982, PCT Pub. No. WO81/03527, PCT Pub. Date Dec. 10, 1981
Continuation of Ser. No. 339,445, Jan. 11, 1982, abandoned. This PCT application May 28, 1981, Ser. No. 656,402
Claims priority, application Finland, Jun. 5, 1980, 801815
Int. Cl.[4] F15B *11/08*
U.S. Cl. 91—420 12 Claims



1. A hydraulic mechanism comprising in combination:

(a) a cylinder having a piston rod adapted to be connected to a load;

(b) a double acting piston within the cylinder, with the cylinder having first and second chambers at respective opposite sides of the piston adapted to be alternately connected to pressurized fluid or vented for controlling movement of the piston;

(c) said piston having elastic means which is elastically compressible due to fluid pressure in one chamber of the cylinder;

(d) first and second valves respectively connected to the first and second chambers for controlling the flow of fluid from the respective chambers in the absence of pressurized fluid being supplied to said chambers, a back pressure in one of the chambers forcing the one valve connected to the one chamber to a closed position; and

(e) valve controlling means operating such that with a back pressure in one of the chambers and with the one valve connected with the one chamber forced to closed position, the other valve cannot be closed;

(f) the elastic means of said piston being elastically compressed during supply of pressurized fluid to one chamber of the cylinder when the piston rod is subjected to an external force holding it against movement in one axial direction, and said elastic means then producing a back pressure in said one chamber of said cylinder in the absence of pressurized fluid being supplied to said chambers so that the one valve is forced to closed position; and

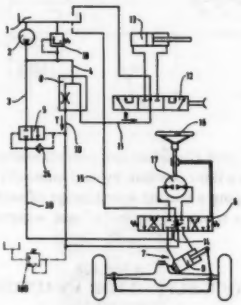
(g) said valve controlling means, with a back pressure in the one chamber and with the one valve forced to closed position, requiring the other valve to be in open position, the position of the piston being maintained due to pressure of fluid locked in said one chamber of said cylinder.

4,558,631

CONTROL SYSTEM FOR TWO HYDRAULIC POWER CYLINDERS SUPPLIED BY A PRESSURE PUMP VIA ONE BRANCH CONNECTION EACH

Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 23, 1982, Ser. No. 443,946
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149026
Int. Cl.[4] B62D *5/06*; F15B *11/20*
U.S. Cl. 91—516 2 Claims



1. In a control arrangement for at least two power operated systems, each having a pressure operating device and a control valve through which operating fluid is supplied to the operating device, one of said systems being of the vehicle steering type, including a common pressure pump from which pressurized fluid is supplied to the control valves of both of said systems, separate branch conduits connected to the pump through which said pressurized fluid is supplied to the operating devices, one of the branch conduits being directly connected to one of the control valves associated with said one of the systems, flow divider means connecting the other of the branch conduits to the other of the control valves for supply thereto of fluid under residual flow, pilot flow means connecting the flow divider means to said one of the control valves for controlling the supply of the operating fluid to the pressure operating device of said one of the systems, a fluid reservoir from which the pump draws the fluid, said one of the control valves being displaceable from a neutral position in which flow of the operating fluid is blocked and fluid communication established between the pilot flow means and the fluid reservoir, to an operative position in which flow through the pilot flow means is blocked and the pressurized fluid in said one of the branch conduits conducted to the operating device of said one of the systems is accordingly reduced in pressure, the improvement comprising pressure regulating valve means (5) connected between said one of the branch conduits (3) and the pilot flow means (10) for regulating the pressure of the operating fluid supplied to said one of the systems in response to a pressure differential between said one of the branch conduits and the pilot flow means, said regulating valve means including a housing enclosing a pair of chambers (19, 23) respectively connected to the pilot flow means (10) and a section (30) of said one of the branch conduits (3), and a valve piston (21) displaceable within the housing between said chambers having pressure faces (20, 22) respectively exposed to the fluid in said chambers, said valve piston (21) being provided with a bore through which fluid is conducted between said chambers, and check valve means (24) for limiting flow through the bore to one direction toward the pilot flow means (10).

4,558,632

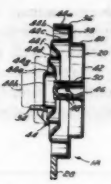
STERILIZED STORAGE CONTAINER

Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, 546 Tustin Ave., Newport Beach, Calif. 92660

Division of Ser. No. 328,701, Dec. 8, 1981, Pat. No. 4,372,921, which is a continuation of Ser. No. 115,678, Jan. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 895,239, Apr. 10, 1978, Pat. No. 4,247,517, which is a continuation-in-part of Ser. No. 821,042, Aug. 1, 1977, Pat. No. 4,251,482, which is a continuation-in-part of Ser. No. 734,228, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,044, Jul. 6, 1976, Pat. No. 4,196,166, which is a continuation-in-part of Ser. No. 640,824, Dec. 15, 1975, abandoned. This application Oct. 4, 1982, Ser. No. 432,446

Int. Cl.[4] G05D *27/00*

U.S. Cl. 92—14 4 Claims



1. A control actuator comprising:

a support plate having means formed thereon for mounting the plate on a supporting structure, said plate being a one piece molded plastic member;

a one piece, molded, thin, flexible bellows-type element secured at its periphery to said plate forming an expandible chamber in combination with the plate, said chamber including means for capturing fluid within said chamber; and

means projecting outwardly from said plate adjacent said expandable chamber for supporting a load whose movement is to be controlled, said projecting means being located so that expansion of fluid captured within said chamber may be utilized to move said support plate and said connecting means;

said mounting means comprising means on one end of said plate to support the plate in cantilever fashion; and

said plate being relatively stiff to support a load but being sufficiently flexible such that expansion of said chamber against a reaction surface will cause said plate to bend.

4,558,633

WEATHERSHIELD FOR AUTOMOBILES

George Lingg, Glendale, N.Y., assignor to Aussie Auto Accessory Imports, Ltd., Glendale, N.Y.

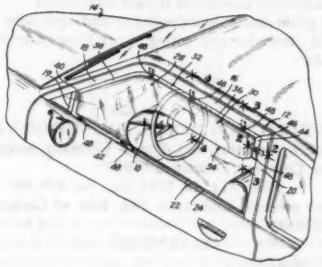
Filed Aug. 3, 1984, Ser. No. 637,616

Int. Cl.[4] G03C *7/00*

U.S. Cl. 98—2.13 5 Claims

1. A weathershield for an automobile for deflecting the air stream flow relative to a moving automobile, said weathershield adapted to be affixed to a window frame of the automobile which includes, relative to the front and rear of the automobile, a top side, a forward side and a substantially vertical rear side, comprising:

a body portion having a length substantially equal to the length of the window frame, said body portion having a substantially convex shape which protrudes outwardly beyond an outer profile of the automobile to which it is adapted to be affixed, said body portion having a rearwardly extending part which extends over the entire rearward and upper portion of the window frame to a position adjacent to said rear side of said window frame;



said body portion being bounded by inner and outer edge regions, said outer edge regions including a rear outer edge region shaped to converge with said substantially vertical rear side of said window frame and terminating substantially within the plane of the window frame;

a substantially planar rear outer edge portion extending outwardly from said rear outer edge region; and

means for coupling said rear outer edge portion to said rear side of said frame.

4,558,634

VENTILATION SYSTEM FOR MOTOR VEHICLES

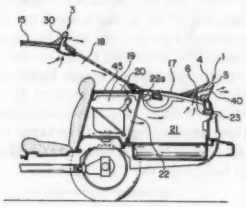
Takao Oshiro, Toyoake; Akira Fukami, and Hideaki Sasaya, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Jul. 13, 1984, Ser. No. 630,529

Claims priority, application Japan, Jul. 13, 1983, 58-128460

Int. Cl.[4] B60H *1/24*

U.S. Cl. 98—2.18 6 Claims



1. A ventilation system in a motor vehicle having a body including a trunk lid, comprising:

(a) means defining a ventilating hole in the trunk lid of the motor vehicle for venting an interior of said body to atmosphere;

(b) an aerodynamic device mounted as a rear air spoiler on the trunk lid and disposed at said ventilating hole, said aerodynamic device having a lower surface held against an outer surface of said body, a substantially horizontal front surface for forming a negative angle of elevation with respect to an air current flowing along said body while the automobile is running, and a rear surface for separating the air current off said body, said front and rear

surfaces being joined to each other at an acute angle along a rear edge of said rear air spoiler, said rear surface being inclined upward and rearward with respect to the vertical, said aerodynamic device having a vent hole extending therethrough from said lower surface to said rear surface in communication with said ventilating hole, said vent hole having an outlet opening at said rear surface and spaced from said rear edge;

(c) a forced-ventilation device disposed in said vent hole and comprising a motor and a fan connected therewith;

(d) a solar cell assembly mounted on said front surface and electrically connected to said motor; and

(e) a grille assembly mounted in said vent hole adjacent to said outlet for preventing water from entering said vent hole.

4,558,635

AIR-EXTRACTION DEVICE FOR MOTOR VEHICLES

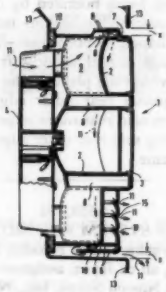
Heinz Dick, Odenthal, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 10, 1984, Ser. No. 639,550

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336003

Int. Cl.⁴ B60H *1/24*

U.S. Cl. 98—2.18 **3 Claims**



1. In a motor vehicle having a rear light including a lamp holder and a lens disposed in an opening in a rear portion of the vehicle bodywork, an air-extraction device wherein the rear light is sealed relative to portions of the bodywork adjacent the opening by webs, the rear light is connected through an opening to the interior of the vehicle, air ducts external to the lamp holder are provided in the rear light leading from the opening, an outlet opening is provided between the ducts and the exterior of the vehicle adjacent the rear light lens and the air ducts are formed in at least an edge area of the rear light and are constructed in the form of double webs extending essentially parallel to one another between the lamp holder and the light lens, the ducts being formed upon the fixed sealing engagement of the lamp holder to the light lens.

4,558,636

PROTECTIVE SHELTER FLOW CONTROL APPARATUS

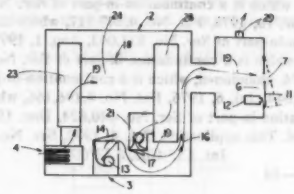
Herbert A. Malmstrom, Creve Coeur, and Henry A. Roddiger, Lake St. Louis, both of Mo., assignors to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Apr. 30, 1984, Ser. No. 605,419

Int. Cl.⁴ F24F *3/16*

U.S. Cl. 98—39.1 **7 Claims**

1. An ambient air flow control arrangement for a protective shelter comprising: a flow through air control housing having air inlet means at one end of said housing and at least two ambient air outlets at the other end of said housing adapted to communicate with a protective shelter, one of said air outlets being larger than the other with the larger air outlet permitting a preselected maximum ambient air flow into the protective shelter when open and the smaller air outlet permitting a preselected minimum ambient air flow into the protective shelter; valve means responsive to air flow cooperating with said ambient air outlets; valve holding means cooperative with said valve means to maintain said larger air outlet in closed position



during periods of high contaminant concentration in the ambient air and to permit minimum air flow through said smaller air outlet; fan means cooperative with said air control housing to move ambient air therethrough; and filter means cooperative with said smaller air outlet to filter the air during minimum air flow operations through said smaller air outlet.

4,558,637

ROOF RIDGE VENTILATOR IMPROVEMENTS

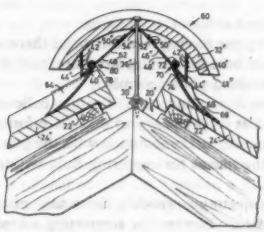
Reginald E. Mason, 1151 Victoria Park Ave., Toronto, Ontario, Canada M4B 2K5

Filed Mar. 12, 1984, Ser. No. 588,241

Claims priority, application Canada, Mar. 11, 1983, 423455

Int. Cl.⁴ F24F *7/02*

U.S. Cl. 98—42.21 **16 Claims**



1. A roof ridge or hip ventilator for longitudinal location along a roof ridge or hip having openings for the passage of air through and the roof surface, and roof ridge or hip cover elements covering said openings, the ventilator comprising: an elongate support member adapted to be located longitudinally, straddling said ridge or hip openings; the support member including longitudinal upright side portions having upper longitudinal peripheral edges for spacing said roof ridge or hip cover elements above the roof surface with the ridge or hip cover elements overhanging the side portions, the side portions having means defining vent openings for the passage of air therethrough, the support member also having a central inner portion connecting the longitudnal side portions, said inner portion having shield portions located adjacent to the side portion vent openings to prevent precipitation passing inwardly through the support member; and the central portion also having means defining vent openings communicating with the ridge or hip openings and the side portion vent openings for the venting of air through the roof ridge or hip with said ridge or hip cover elements in place.

4,558,638
VENTILATING PROFILE FRAMES FOR CLOSURE PANELS

Siegfried Rock; Hans-Peter Rainer; Reinhold Herzog, all of Graz; Werner Wertitsch; Günter Kromus, both of Vienna, and Fritz Kölbl, Niklasdork, all of Austria, assignors to Contacting-Gesellschaft fur Wirlshaftskontakte GmbH, Vienna, Austria

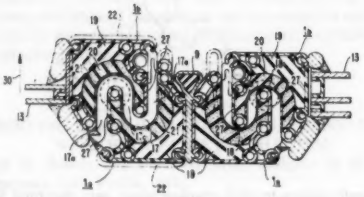
PCT No. PCT/AT82/00019, § 371 Date Feb. 15, 1983, § 102(e) Date Feb. 15, 1983, PCT Pub. No. WO82/04460, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 16, 1982, Ser. No. 467,484

Claims priority, application Austria, Jun. 17, 1981, 2704/81

Int. Cl.⁴ E06B *7/02*

U.S. Cl. 98—88.1 **13 Claims**



1. A closure panel assembly, such as a window, a door, a partition wall, and the like, comprising a planar member secured in a first, movable profiled frame and a second, stationary profiled frame, said first frame being mounted for movement with respect to said stationary frame, between a closed position in which said first frame is sealingly engaged with said second frame, and an open aeration position produced by translation movement of said first frame away from said second frame in a direction substantially perpendicular to the plane of said planar member, each of said frame members having a longitudinal extending U-shaped groove provided with a side boundary wall parallel to said direction of movement defining a leg of said U-shaped groove, said side boundary wall being adapted to engage correspondingly in the U-shaped groove of the opposite frame member, by said corresponding engaging of the side boundary wall of the U-shaped groove of the first frame in the U-shaped groove of the second frame and the side boundary wall of the U-shaped groove of the second frame in the U-shaped groove of the first frame and in said aeration position, a continuous serpentine aeration gap being provided between said first and second frames including a first gap portion extending from one said of said planar member in the direction of movement of said first frame, a second gap portion parallel to and extending in a direction opposite to said direction of movement of said first frame, a third gap portion parallel to said first and second portions and extending in the same direction of movement of said first frame to the opposite side of said planar member, said gap portions being interconnected by intermediate passage means to thereby define a continuous serpentine path between said first movable frame and said stationary second frame, and in said closed position, said frame members are in sealing engagement with each other and in said aeration gap between said first frame and second frame are provided noise damping means and sealing means on at least one of said frame members.

4,558,639
INSERT FOR A CONTAINER FOR AGING WINE

David E. Hojnoski, Smithville, Canada, assignor to Jalger Limited, Winona, Canada

Filed Jun. 14, 1984, Ser. No. 620,708

Int. Cl.⁴ C12H *1/22*

U.S. Cl. 99—277.1 **4 Claims**

1. An apparatus for aging wine, comprising

(1) a container, and

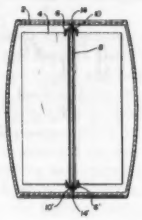
(2) an insert for said container, comprising:

a vertical shaft having a lower end and an upper end,

a lower cup secured to said shaft at its lower end,

an upper cup secured to said shaft at its upper end,

a plurality of uncharred solid planar oak members radially disposed about said shaft, each planar oak member having a slot in its lower edge for engaging said lower cup and a slot in its upper edge for engaging said upper cup,



wherein said planar oak members are firmly held in spaced relationship from each other by pressure exerted between said secured lower cup and second secured upper cup,

and wherein the parameters of the oxidation and extraction reactions occurring during aging of the wine are known as a function of the surface:volume relationship of the container and its insert.

4,558,640
APPARATUS FOR MAKING HOT DRINKS

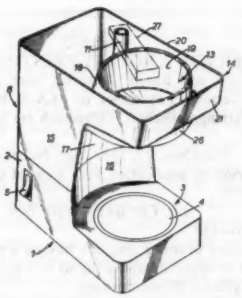
David J. Marchant, Chineham, England, assignor to Ti Russell Hobbs Limited, Stoke-on-Trent, England

Filed Mar. 13, 1984, Ser. No. 589,696

Claims priority, application United Kingdom, Mar. 15, 1983, 8307018

Int. Cl.⁴ A47J *31/12*

U.S. Cl. 99—307 **15 Claims**



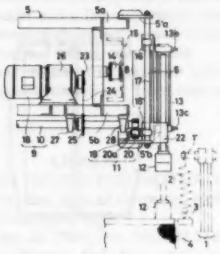
1. Apparatus for making hot drinks by passing hot water through a filter containing solids from which the drink is to be made, to yield an infusion which is collected in a receptacle, the apparatus comprising a reservoir for water from which the drink is to be made, a heater, a filter holder which is shaped to contain the filter and has an outlet for an infusion from the filter, and means for supplying water from the reservoir, via a heater, to the filter holder, and in which the filter holder is formed as an integral part of the reservoir.

4,558,641

APPARATUS FOR OSCILLATING FILTER CLOTH OF FILTER PRESS

Masayuki Nakamura, Osaka, Japan, assignor to Kurita Machinery Manufacturing Company Limited, Osaka, Japan

Filed Dec. 7, 1983, Ser. No. 559,186
Int. Cl.⁴ B30B *9/06*; B01D *25/12, 25/38*
U.S. Cl. 100—198 **8 Claims**



5. In a filter cloth oscillating apparatus for a filter press wherein the filter cloth hangs from a rod suspended from springs and extends laterally perpendicular to the direction of opening of filter plates of the press, the oscillating apparatus being mounted on a bed movable horizontally in the direction of opening of the filter plates and having a head movable upwardly and downwardly to a position of contacting engagement with the filter cloth hanging rod, the improvement comprising:

a crank shaft rotatably mounted on the bed;

a crank arm on said crank shaft to be rotated thereby;

drive means operatively connected to said crank shaft to rotate said shaft;

a head actuating member operatively connected at one position thereof to said crank arm and at a second position to said bed so that said second position is moved reciprocally with respect to said bed by circular oscillation at the first position produced by said crank arm;

means to support the head on said head actuating member for movement therewith; and

head raising and lowering means on said head actuating member and connected to the head to move the head relative to said head actuating member.

4,558,642

DAMPER FOR A ROTARY PRINTING MACHINE

Rainer Burger, and Rudolf Annecke, both of Augsburg, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 27, 1984, Ser. No. 654,868
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336875
Int. Cl.⁴ B41F *7/26, 7/30*
U.S. Cl. 101—148 **9 Claims**

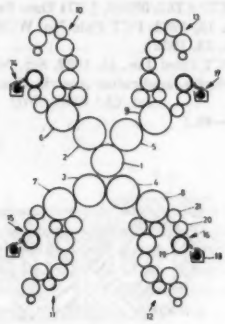
1. In a rotary printing machine having a plate cylinder (8), a damper to apply damping liquid to a printing plate on the plate cylinder (8) comprising

a damping liquid receiving roller (19) having a hard damping liquid accepting surface;

a spray device (18) spraying damping liquid on the hard surface of the receiving roller, the damping liquid collecting on the receiving roller in drops or droplets as derived from the spray device;

means for transferring damping liquid from said receiving roller (19) while rendering uniform the damping liquid received from the receiving roller, and collected thereon in form of drops or droplets, and for application to the plate cylinder as a uniform film consisting of

at least one damping liquid transfer roller (20; 201, 202) having an elastic surface, and contacting said receiving roller for transferring damping liquid from the receiving roller (19) and a damping liquid application roller (21) having a soft elastic surface in contact with both said plate cylinder and at least one of said liquid transfer rollers (20, 201, 202) for transferring damping fluid from said liquid



transfer roller to said printing plate, said damping liquid application roller and said at least one damping liquid transfer roller all being mounted for rotational movement without axial oscillation;

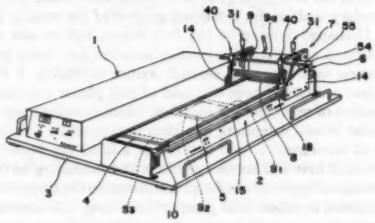
said transferring means serving as a means for preventing the formation of non-uniformities on matter being printed due to the formation of water drops.

4,558,643

PROOF-PRINTING MACHINE

Makoto Arima, Amagasaki; Takashi Tsumura, Habikino, and Akihiko Ueda, Nishinomiya, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed Mar. 8, 1985, Ser. No. 710,307
Claims priority, application Japan, Mar. 9, 1984, 59-46066
Int. Cl.⁴ B41F *3/28, 3/60*
U.S. Cl. 101—158 **4 Claims**



1. A proof-printing machine comprising

an elongated table for mounting a printing plate thereon detachably which is supported by a base frame,

a carriage means being movable along the table in the longitudinal direction hereof,

a head means being mounted on the carriage means,

a doctor blade means for applying ink onto the printing plate so supported by the head means as to be adjustable of its angle and contact pressure against the printing plate,

a cylindrical press drum being supported by the head means so as to be rotatable about the axis thereof and adjustable of its contact pressure against the printing plate onto the peripheral surface of which a blank material to be printed is fixed,

a pair of timing belt means for transferring the carriage each

of which is spanned between a pair of pulleys provided at each end portion of the side wall of the table respectively,

a pulse motor for driving said timing belt means, and control means for driving the pulse motor according to a predetermined optimum driving pattern,

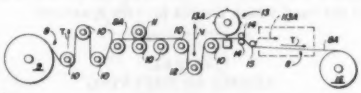
said control means having memory means memorizing at least one acceleration pattern for accelerating the carriage up to a predetermined objective velocity within a distance defined between start position and first position being set just before the beginning end of the printing area of the printing plate and at least one deceleration pattern for decelerating the carriage from the objective velocity to zero within a distance defined between second position and stop position, said second position being defined as a position where the press drum has been passed the printing area completely and said optimum driving pattern being determined based upon said acceleration and deceleration patterns according to the objective velocity being selectively designated.

4,558,644

PRINTING PRESS WITH PARALLEL TRANSVERSE WEAKENING LINE MECHANISM

Ernest B. Bunch, Jr., Phoenix, Ariz., assignor to B. Bunch Company, Inc., Peoria, Ariz.

Filed Dec. 28, 1984, Ser. No. 687,268
Int. Cl.[4] B41F *13/36*
U.S. Cl. 101—226 **1 Claim**



1. Apparatus for imprinting an elongate strip of paper moving along a path of travel through the apparatus, said paper strip having a pair of parallel elongate peripheral edges, said apparatus including

(a) primary frame means;

(b) a roll of paper rotatably mounted on said frame means to supply said strip of paper moving through said apparatus;

(c) at least one drum rotatably mounted on said frame means for contacting and imprinting said strip of paper moving through said apparatus;

(d) roller means rotatably mounted on said frame means and adapted to contact and form transverse, parallel lines of weakening at spaced intervals along said paper strip moving through said apparatus;

(e) a take-up roller for receiving said paper strip after said strip has contacted and moved past said imprinting drum and said roller means;

(f) a plurality of guide rollers rotatably mounted on said frame means and contacted by said strip of paper moving through said apparatus, said guide rollers, imprinting drum and roller means generally defining said path of travel of said strip of paper from said supply roll through said apparatus, one of said guide rollers being positioned along said path of travel intermediate said roller means and take-up roller, said paper strip moving through said apparatus along said path of travel within an envelope generally bounded by a pair of imaginary vertical parallel planes each intersecting one of said elongate peripheral edges of said paper strip;

(g) secondary frame means operatively associated with said primary frame means;

(h) an oscillating chute mounted on said secondary frame means for alternately distributing at least some of said lines of weakening in said paper strip in substantially opposite directions;

(i) a feed roller carried on said secondary frame means for dispensing said continuous strip of paper into said oscillating chute;

(j) folding means carried on said secondary frame means and operatively associated with said oscillating chute for urging said paper distributed by said chute into a folded condition, said folding means including

(i) spirals shaped and dimensioned to receive and carry away from said oscillating chute creased edges of paper distributed by said chute, said spirals being independently adjustable prior to the operation of said apparatus, and

(ii) beaters for periodically tamping said paper distributed by said chute, said beaters assisting in the folding and positioning of said paper and being independently adjustable prior to the operation of said apparatus,

said spirals and beaters moving in synchronous relationship with said chute during the operation thereof,

(k) a support surface mounted on said apparatus for receiving paper dispensed by said spirals and beaters;

(l) paper stops mounted on said secondary frame means and positioned above said support surface, each of said paper stops having at least one upstanding face for contacting and preventing the lateral travel of creased edges of paper distributed by said chute;

(m) first gear train means carried on said primary frame means for transmitting motive power to at least one of the group consisting of said guide rollers, said take-up roller, said imprinting drum, and said roller means mounted on said primary frame means to draw said paper strip from said supply roller through said apparatus and along said path of travel;

(n) power means to drive said first gear train means;

(o) second gear train means carried on said secondary frame means for driving and transmitting motive power to said feed roller, oscillating chute and folding means such that generally synchronized movement thereinbetween is maintained, a portion of said gear train means actuating said chute and folding means without actuating said feed roller;

(p) means for driving said second gear train means;

(q) means carried on said secondary frame means for simultaneously adjusting said oscillating chute and said folding means in relation to said feed roller while maintaining said generally synchronous movement between said chute and folding means, said adjustment means including

(i) at least one driven shaft positioned along said second gear train means and transmitting motive power to said portion of said second gear train means actuating said oscillating chute and said folding means, said drive shaft having a first segment and a second segment, and

(ii) a differential unit positioned between and interconnecting said first shaft segment and said second shaft segment for rotating and advancing and retarding said first shaft with respect to said second shaft so that said synchronous movement of said oscillating chute and said folding means may be adjusted in relation to said feed roller when said second gear train means is driving said feed roller, oscillating chute, and folding means;

said secondary frame means connected to said primary frame means for movement between at least two operative positions,

(r) a first operative position with said feed roller generally parallel to said guide rollers, supply roll and take-up roller, and positioned to receive said paper strip from said guide roller positioned intermediate said roller means and said take-up roller such that said paper strip received by said feed roller generally lies within said envelope bounded by said first and second parallel imaginary planes; and,

(s) a second operative position with said feed roller and secondary frame means generally displaced to a position outside of said envelope bounded by said first and second parallel imaginary planes;

said paper strip moving through said apparatus being directed

from said guide roller positioned intermediate said roller means and said take-up roller to

(t) said feed roller and through said chute and folding means when said secondary frame means is in said first operative position; and,

(u) said take-up roller when said secondary frame means is in said second operative position.

4,558,645

WARHEAD

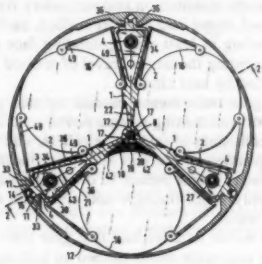
Dieter Boeder, Duesseldorf, and Werner Grosswendt, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 17, 1983, Ser. No. 565,736

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301873

Int. Cl.[4] F42B *13/50*

U.S. Cl. 102—489 20 Claims



1. An improved warhead for transporting a plurality of useful loads in a useful load chamber which is disposed inside an outer casing and which is divided into a plurality of cells by a hollow body and includes means for expelling the useful loads from the warhead in a direction transverse to the longitudinal axis of the warhead, the improvement comprising in combination,

(a) the hollow body is star-shaped and forms at least three mutually joined bracing elements formed by three leg portions of the hollow body which extend in a longitudinal direction parallel to the longitudinal axis of the casing and also extend radially outwardly therefrom;

(b) an upper end plate and a lower end plate abut against the axial opposite ends of the casing and the hollow body, and pretensionable connecting means biasing the upper and lower end plates towards each other so as to press them against the axial upper and lower ends of the casing and hollow body;

(c) the inner wall of said casing and said hollow body having a plurality of longitudinally extending connecting means so as to prevent a relative movement between said hollow body and said casing in the peripheral direction but permit a longitudinal slidable relative movement in the axial direction of the casing and hollow body, whereby said casing preponderantly transfers in the region of the useful load chamber torsional loads whereas the acceleration, respectively decelaration forces formed by inertial forces of the useful loads are separately preponderantly transferred by the hollow body;

(d) each leg portion of the hollow body has an outer radial wall portion on the outer wall of which a longitudinally extending first groove is disposed for holding a detonating charge therein for severing said casing upon ignition of the detonating charge; and

(e) an inflatable bag is disposed between each pair of said adjoining leg portions of said hollow body, said hollow body defining a central axial pressurized gas passage and a plurality of radial pressurized gas passages which are in fluid communication with each inflatable bag.

4,558,646

PROJECTILE BODY WITH A ROTATING BAND OF PLASTIC

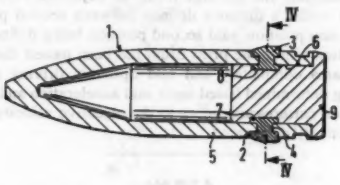
Dietrich Hoffmann, Schramberg, and Udo Götz, Trossingen, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,598

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334022

Int. Cl.[4] F42B *31/00*

U.S. Cl. 102—527 10 Claims



1. A projectile particularly for use in rapid fire weapons and high performance guns, comprising a hollow projectile body having an exterior surface with an annular groove therearound with apertures extending through the groove to the interior of said body distributed around the periphery of the groove, and a rotating band positioned in the groove secured against displacement caused by centrifugal accelerating forces by portions of the band which project into the apertures.

4,558,647

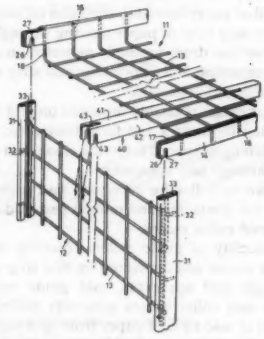
MODULAR SHELVING

Svend Petersen, 2425 Lucknow Dr., Mississauga, Ontario, Canada L5S 1H1, assignor to Svend Petersen, Toronto, Canada

Filed Sep. 1, 1983, Ser. No. 528,547

Int. Cl.[4] A47B *57/14, 55/02*

U.S. Cl. 108—107 12 Claims



1. A modular shelving unit comprising:

at least two upright members, each member comprising a latticework having prongs along two opposing edges thereof, said prongs being alternately bent at approximately right angles to the plane of the latticework, and a first support beam for each edge of the latticework having bent prongs, each said first beam being formed to define a longitudinal channel of C-shaped cross section so that the bent edge prongs of the latticework may be inserted and fixed within said longitudinal channel, said first support beams providing upright structural components for the unit; and

at least two shelf elements, each element comprising a lat-

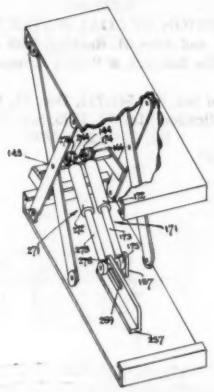
ticework having prongs along two opposing edges thereof, and a second support beam for each latticework edge having prongs, each said second beam being formed to define a longitudinal channel of U-shaped cross section so that the edge prongs of the latticework may be inserted and fixed within said channel, said second beams having means at each end for engaging the latticework of an upright member, said shelf elements being engagable with oppositely spaced upright members to form a shelving unit.

4,558,648

ENERGY-RECYCLING SCISSORS LIFT

Duane R. Franklin, Northridge, and Archibald D. Evans, Newbury Park, both of Calif., assignors to Lift-R Technologies, Inc., Los Angeles, Calif.

Filed Sep. 20, 1983, Ser. No. 534,175
Int. Cl.[4] A47B *9/16*
U.S. Cl. 108—147 **10 Claims**



1. A scissors lift for use in repetitively raising and lowering an article, and comprising:

upper and lower support elements arranged for vertical motion of the upper element between a relatively retracted position and a relatively extended position above the lower element, the upper support element being adapted to hold such article;

a scissors mechanism pivotally connected to the upper support element and pivotally connected to the lower support element for carrying the upper element above the lower element, said scissors mechanism including a pair of scissors legs having ends which in operation translate along the support elements;

attachment-structure means secured to at least one scissors leg;

a stop and a pivotal-attachment boss respectively fixed to one of the support elements;

first sealed gas cylinder means, having a first end that is pivotally fixed to the attachment-structure means and having an opposed second end that is pivotally fixed to the pivotal-attachment boss, for operating the scissors mechanism to move the upper support element upwardly from the retracted position and to the extended position; and

second sealed gas cylinder means, having a first end that is pivotally fixed to the attachment-structure means and having an opposed second end that is restrained by said stop when the upper support element is in and near the retracted position, for assisting said first sealed gas cylinder means in operating the scissors mechanism to move the upper support element upwardly from the retracted position through a predetermined distance toward but not to the extended position; and

release and guide means for permitting said opposed second end of the second cylinder to move away from said stop after movement of the upper support element upwardly through said predetermined distance, and for guiding said opposed second end of the second cylinder back to said stop while the upper support element moves from the extended position downwardly toward the retracted position;

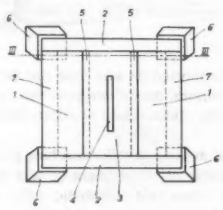
whereby the weight of such article on the upper support element is substantially borne by both cylinder means when the upper support element is in the retracted position, but by only the first cylinder means when the upper support element is in the extended position.

4,558,649

TABLE MADE UP OF A NUMBER OF PARTS, MORE ESPECIALLY A BENCH

Peter Maier, Gerokstrasse 1, D-7311 Neidlingen, and Günther Arnold, Albstrasse 5, D-7441 Kohlberg, both of Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,965
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228141
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—159 **10 Claims**



1. A work table, comprising four table legs and a table top supported by said table legs, said table top having an opening therein in which a changing plate can be removably supported so that an upper side of said changing plate is substantially flush with an upper side of said table top, wherein said table top includes two first sections of the same size which each have a rectangular upper surface, which are spaced from one another, and which extend parallel to one another, and includes two second sections of the same size which each have a rectangular upper surface, which are spaced from one another, and which extend peripendicular to said first sections, said opening being between said first sections and between said second sections; wherein edges of said first sections which are adjacent said changing plate have steps thereon which support said changing plate between said second sections; wherein one of said first sections and said legs have grooves therein and the other thereof have pins receivable in said grooves, said pins and grooves defining a plug connection which releasably connects each said leg to said table top; and wherein said table legs each form an obtuse angle with respect to said table top.

4,558,650

AUTOMATIC TELLER MACHINE ENCLOSURE

James Berman, New York, N.Y.

Filed Dec. 1, 1983, Ser. No. 556,966
Int. Cl.[4] G07F *5/00*
U.S. Cl. 109—24.1 **7 Claims**

1. A compact, secure enclosure for an automatic teller machine, the teller machine having a secure front panel and an operable rear panel, the enclosure comprising:

an upright wall defining an enclosure for an automatic teller

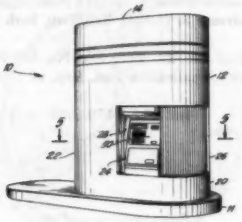
machine, said enclosure having a forward portion in which the automatic teller machine is located and a rearward portion sufficiently large to permit servicing the automatic teller machine from inside the enclosure,

said upright wall including a substantial curved portion,

said upright wall having a substantial rigid stationary segment, said stationary segment having a cut-out zone extending a substantial distance along said curved portion of said wall, the height of said cut-out zone being sufficient to accommodate the front face of the automatic teller machine,

a flexible shield connected to both sides of the automatic teller machine and extending across said cut-out zone and along the inner surface of said curved portion of said stationary segment, said flexible shield providing a movable segment of said upright wall at said cut-out zone,

a base capable of supporting the automatic teller machine, said base mounted for rotation within said enclosure, said base being capable of rotating so that the automatic teller ma-



chine when supported on said base can assume at least two significant positions, one of said positions being a normal use position and the other of said positions being a service position,

a portion of said automatic teller machine projecting outward from said flexible shield segment of said wall through said cut-out zone when said automatic teller machine is supported on said base in either said first or said second significant positions such that the front face of the automatic teller machine is accessible to a user in both of said significant positions,

said flexible shield being mounted for movement along the innner surface of said stationary segment of said wall, said shield being connected to said automatic teller machine for coordinated movement therewith across said cut-out zone as said base is rotated to provide continuous security for the cut-out zone, and

a lockable door in said wall to allow a person to unlock same and enter into the rearward portion of said enclosure.

4,558,651

FIRED HEATER FOR COAL LIQUEFACTION PROCESS

David H. S. Ying, Macungie; Wayne T. McDermott, Allentown, and Edwin N. Givens, Bethlehem, all of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Oct. 19, 1983, Ser. No. 543,639

Int. Cl.[4] F23D *1/00*; C10G *1/06*

U.S. Cl. 110—347 **10 Claims**

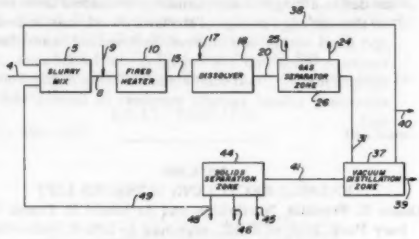
1. A method of operating a fired heater for heating a three-phase mixture of hydrogen gas and a coal/solvent slurry flowing from a slurry preparation stage to a dissolver stage in a coal liquefaction process comprising:

(1) passing the three-phase mixture through the fired heater by way of a substantially horizontal pipe;

(2) passing the coal/solvent slurry through said pipe at a superficial velocity greater than 5 feet per second (1.52 m/sec) and less than 25 feet per second (7.62 m/sec);

(3) the pipe diameter being less than 6 inches (15.2 cm);

(4) maintaining the gas superficial velocity to be less than 3 feet per second (0.91 m/sec); and



(5) maintaining the volumetric flow velocity ratio of gas to coal/solvent slurry between 0.1 and 0.7.

4,558,652

COMBUSTION OF COAL-WATER SLURRIES

William Downs, and John M. Rackley, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 561,712, Dec. 15, 1983, abandoned. This application May 31, 1985, Ser. No. 739,510

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **3 Claims**

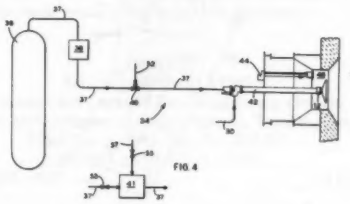


FIG. 4

1. A combustion process for achieving stable ignition of coal-water slurries during start-up of industrial and utility steam generators comprising:

introducing essentially pure oxygen in a dual-flow atomizer;

introducing a coal-water slurry in a dual-flow atomizer;

atomizing and igniting the slurry, and

switching from essentially pure oxygen to a conventional atomizing fluid after stable ignition of the slurry.

4,558,653

LABEL ADVANCING SYSTEM FOR A LINE CLOSER MACHINE

Gilbert L. Horton, Kernersville; Eddie D. Poole, Lexington, and John W. Foreman, Jr., Elkin, all of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Jan. 14, 1985, Ser. No. 691,281

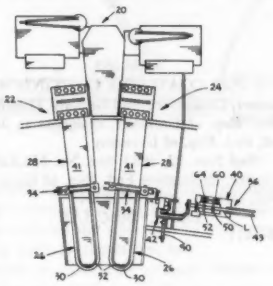
Int. Cl.[4] D05B *21/00, 97/00*

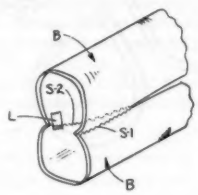
U.S. Cl. 112—262.2 **16 Claims**

1. A label handling apparatus for use with a line closer machine having sewing instrumentalities for seaming together a pair of individual, tubular hosiery blanks for forming the panty portion of a panty hose garment comprising a supply source of label strip material, means for intermittently feeding a predetermined length of label strip material to a prescribed location, means for clamping the label strip advanced by said feed means to said prescribed location, means for severing said predetermined length of label strip material to define a discrete label, and means for displacing said clamping means and said label in a first direction to position the label internally of one blank of said pair of hosiery blanks and in a second direction to

advance said label past the sewing instrumentalities of the line closer machine to sew the label to the hosiery blanks as the pair of blanks is seamed together.

16. The method of sewing a label to a panty hose garment during the formation of the U-shaped seam sewing together two expanded tubular hosiery blanks to form the garment panty portion comprising the steps of: displacing superposed, expanded hosiery blanks in a first direction relative to sewing instrumentalities to a position with the instrumentalities positioned within the blanks, sewing adjacent portions of the fabric blanks together to define spaced, generally parallel seams as the blanks are displaced relative to the sewing instrumentalities, cutting the fabric between the spaced, generally parallel means, selectively displacing a label from a first location remote to the hosiery blanks to a second location within the confines of one of the hosiery blanks during the formation of the parallel seams, and attaching the label to the blanks during formation of the seams.





4,558,654

UNDER BED THREAD TRIMMER WITH THREAD DETECTOR STOP MOTION

Lothar Schilling, Kaiserslautern, and Karl H. Schiller, Rockenhausen, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

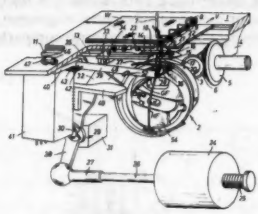
Filed Oct. 3, 1984, Ser. No. 657,340

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1983, 8329216[U]

Int. Cl.⁴ D05B *51/00*

U.S. Cl. 112—298 **7 Claims**

1. A device for stopping the machine drive of a needle movable in cooperation with a rotary hook of a sewing, embroidering, or tufting machine upon a thread breakage, comprising a thread cutting mechanism including a thread catcher movable through the needle path, a switching mechanism connected to the drive for disconnecting the machine drive upon a thread breakage, movably mounted thread feeler carrier, a thread feeler provided on said carrier being locatable between the needle and the rotatable hook, a drive mechanism for actuating said thread catcher, and means associated with said drive mechanism for moving said thread feeler carrier



with said thread feeler out of the path of the thread catcher during the operation thereof.

4,558,655

SAIL UNIT FOR THE PURPOSE OF SPORT AND COMPOSITE DEVICE RELATED TO SAID UNIT

Philippe Debarge, c/o T.C.F., 2 Quai de la Conférence, 75008 Paris, France

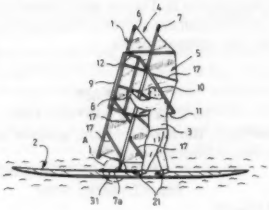
PCT No. PCT/FR83/00095, § 371 Date Jan. 17, 1984, § 102(e) Date Jan. 17, 1984, PCT Pub. No. WO83/04235, PCT Pub. Date Dec. 8, 1983

PCT Filed May 18, 1983, Ser. No. 577,625

Claims priority, application France, May 25, 1982, 82 09102

Int. Cl.⁴ B63H *9/06*

U.S. Cl. 114—39 **8 Claims**



1. Sailboards comprising a sail assembly and a floatboard (2) supporting said sail assembly, said sail assembly comprising two wings (4, 5) in relatively displaced relation to each other, said two wings having substantially parallel leading edges (6, 7), said two wings being connected together by a rigid supporting frame ensuring a constant relative positioning of said wings, this supporting frame being provided with gripping means (8, 10) for the user, one (7) of said leading edges having an end (7a) which is removably and pivotably fixed to the floatboard (2), thus permitting the user to move the said sail assembly during navigation between a position where said end (7a) of said one leading edge is pivotably fixed to the floatboard and a position where said sail assembly is dissociated from the floatboard and maintained by the user in a substantially horizontal position to produce a sustentation effect.

4,558,656

SIREN

John G. Powell, Northridge, Calif., assignor to Southern California Edison Company, Inc., Rosemead, Calif.

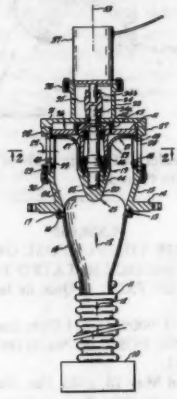
Filed Mar. 31, 1983, Ser. No. 480,851

Int. Cl.⁴ G10K *7/04*

U.S. Cl. 116—147 **23 Claims**

1. A siren comprising means for receiving a compressed gas supply, guide means for directing the supply in a first substantially axial flow direction, stationary deflector means for changing the first flow direction substantially transverse to the

first flow direction, rotor means with spaced port means mounted for rotation about an axis substantially parallel to the first air flow direction, the spaced rotor port means being arranged for traversing a path across the transverse air flow direction, stator means in substantial alignment with the rotor means, stationary vane means forming compartments with the



deflector means and the stator means to substantially inhibit airflow between adjacent compartments, and said stator means including spaced stator port means, whereby on rotor rotation, the rotor port means and stator port means move periodically into and out of alignment thereby to permit the periodic egress of gas from the compartments.

4,558,657

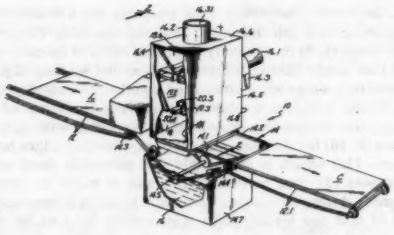
SPRAYING APPARATUS

Walter Rohrbach, Burnsville, Minn., assignor to Midwest Automation, Inc., Minneapolis, Minn.

Filed Jul. 11, 1980, Ser. No. 168,756

Int. Cl.[4] B05C *5/00*

U.S. Cl. 118—70 **6 Claims**



1. Spraying apparatus for applying sprayed particles upon a workpiece comprising means defining a spray compartment having a workpiece-spraying station, spray gun means in the compartment for spraying particles onto a workpiece in the workpiece spraying station, and exhaust means for exhausting air-entrained sprayed particles from the spray compartment, the apparatus being characterized by means providing a rapid flow of air past the spray gun means generally toward the workpiece spraying station of sufficient velocity as to prevent sprayed, air-entrained particles from depositing on the spray gun means, and the spray compartment including walls having edges adjacent the workpiece spraying station and defining means cooperating with a workpiece in the workpiece spraying station to abruptly change the direction of air containing sprayed entrained particles from a first direction generally toward the workpiece spraying station about said edges to a second direction generally away from the workpiece spraying station, whereby air-entrained particles are urged into contact with the workpiece.

4,558,658

DEVICE FOR COATING A CONTINUOUS WEB

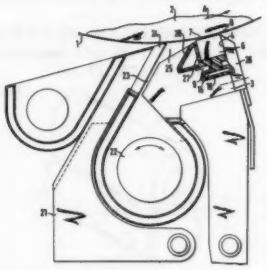
Herbert Sommer, Dusseldorf, and Gerhard Wohlfeil, Monheim, both of Fed. Rep. of Germany, assignors to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,520

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305966; Oct. 21, 1983, 3338324

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—411 **21 Claims**



1. In a device for coating a continuous web which travels over a backing member, in which device the force of application can be adjusted, comprising a slotted pipe for applying the coating material to the web, the slotted applicator pipe extending over the width of the web and having a preliminary coating-material flow-regulating gap the width of which can be adjusted, a coating-material flow regulating lip and a return lip adjoining the slotted applicator pipe in such a way as to constitute a coating-material flow-regulating chamber extending over the width of the web, the improvement wherein

(a) the flow-regulating lip has a doctor batten that moves with little friction along at least one overflow-side slide face of a doctor bed that constitutes the flow-regulating lip,

(b) the face of the doctor batten toward the web that is being coated is rectangular and has an overflow edge and in conjunction with the web defining a narrowing wedge-shaped gap with a geometry that depends on the degree of contact pressure,

(c) the overflow edge of the face of the doctor batten constitutes a straight and sharp stripping edge,

(d) the face and stripping edge of the doctor batten are flexible,

(e) the face is highly resistant to wear,

(f) the doctor batten is forced against the web by an elastic means of exerting contact pressure between the batten and the bed, and

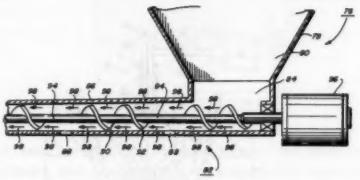
(g) the device includes a support for the batten permitting movement of at least portions of the flexible batten toward and away from the backing member across the machine width so that the flexible batten is free to adjust the changes in what it confronts.

4,558,659

PARTICLE DISPENSING SYSTEM

Jerome S. Alden, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1982, Ser. No. 411,774
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—653 8 Claims



1. An apparatus for dispensing particles, including:

a substantially tubular member having an entrance port for receiving particles and a plurality of apertures therein for dispensing particles therefrom; and

means, operatively associated with said tubular member, for transporting the particles therealong, said transporting means comprising a plurality of sets of protuberances with each of said sets of protuberances being spaced from one another in the region of the apertures in said tubular member so that the particles are dispensed substantially uniformly from the apertures in said tubular member with clogging and caking of the particles being substantially prevented.

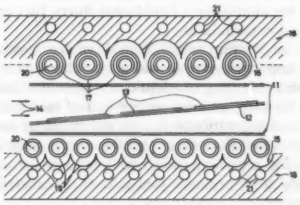
7. An apparatus according to claim 6, wherein each of said sets of protuberances extends in a spiral configuration.

4,558,660

SEMICONDUCTOR FABRICATING APPARATUS

Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Miyagi, Japan, assignors to Handotai Kenkyu Shinkokai, Japan

Filed Mar. 16, 1983, Ser. No. 475,828
Claims priority, application Japan, Mar. 16, 1982, 57-41943
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—725 4 Claims



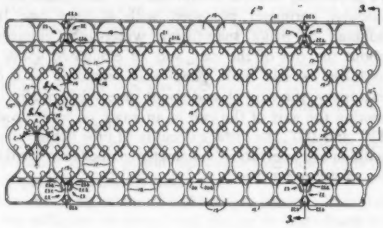
1. A semiconductor fabricating apparatus comprising a reaction chamber having a gas inlet and a gas outlet, a support means disposed in said reaction chamber for supporting semiconductor wafers thereon, an infrared lamp means for irradiating exposed surfaces of said semiconductor wafers and an ultra-violet lamp means for irradiating said exposed surfaces of said semiconductor wafers overlappingly with said infrared irradiation, further comprising a vacuum means connected to said reaction chamber for evacuating an interior of said reaction chamber to maintain an inner pressure thereof at a super low pressure prior to a commencement of reaction.

4,558,661

EGG HOLDING FLAT

Arthur W. Theilig, Jefferson County, and John Poplis, Walworth County, both of Wis., assignors to The Marmon Group, Inc., Chicago, Ill.

Filed Feb. 22, 1980, Ser. No. 123,692
Int. Cl.[4] A01K *41/00*
U.S. Cl. 119—43 6 Claims



1. An egg flat for receiving and supporting a plurality of eggs, said flat having

spaced parallel side walls,

a plurality of sinuous partition walls extending between said side walls and defining a plurality of transverse rows of egg receptacles arranged in honeycomb fashion with each receptacle being formed with walls in the shape of a pair of ogee arches joined at their open ends with the arches on a common axis and the apices thereof extending in opposite directions,

the receptacles in adjacent rows being longitudinally staggered relative to one another by about one-half the length of a receptacle, and

egg support fingers extending from said partition walls inwardly at the bottom of each receptacle for engaging and supporting an egg within the receptacle with the exterior of the eggs spaced from the receptacle walls, and

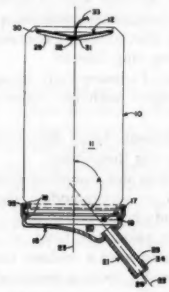
support means located on the underside of the flat for supporting same on a rest surface with the bottoms of the receptacles spaced above the rest surface.

4,558,662

HUMMINGBIRD FEEDER

Walter E. Peterson, Box 696, Diablo, Calif. 94528

Filed Jan. 14, 1985, Ser. No. 691,211
Int. Cl.[4] A01K *39/02*
U.S. Cl. 119—77 6 Claims



1. A kit adapted to produce a hummingbird feeder device when associated with a beverage can having a circular cylindrical sidewall, upper and lower closure panels, and a circular rim extending outwardly from said sidewall in substantially coplanar alignment with said upper panel, said lower panel

being recessed toward the interior of the can and bounded by a circular collar of smaller diameter than said sidewall, and said upper panel being provided with a pouring aperture communicating with the interior of the can, said kit being comprised of:

(a) holding means adapted to non-penetratively engage the lower closure panel or associated circular collar of said can, fabricated from flat sheet stock, and having a centrally located aperture, and

(b) a dispensing member comprised of a basin panel having a circular perimeter provided with at least one flange adapted to make snap-fitting water-tight engagement about the rim of the can, and an elongated spout tube attached to said basin panel and extending to a distal extremity, the axis of said spout tube substantially intersecting the axis of the can at an angle of between about 120° and 160°, the distal extremity of tube being provided with an exit aperture of a diameter smaller than the diameter of the spout tube.

4,558,663

SAFETY DEVICE FOR CHOKER-COLLAR

John N. Kaplanis, 2916 Brierdale La., Bowie, Md. 20715

Continuation-in-part of Ser. No. 630,828, Jul. 13, 1984, abandoned. This application Dec. 20, 1984, Ser. No. 684,137

Int. Cl.⁴ A01K *27/00*

U.S. Cl. 119—106 **12 Claims**

1. A safety device for attachment to the free riding ring of a choker-collar to be worn by an animal comprising:

a first plate member having a first skirt extending from the periphery of the inner surface thereof;

a second plate member separable from and adapted to associate with said skirt to form a container of a size to receive said free riding ring therein;

a respective one of telescopically engagable tubular elements centrally integral with the inner surface of each plate member;

said tubular elements being dimensioned to accommodate said running ring thereabout;

a first open-ended slot extending from the skirt periphery and adapted to accommodate therein an intermediate section of said choker-collar; and

the operatively associated faces of said tubular elements being fabricated from a resilient material and configured to form releasable locking means when telescoped;

whereby the safety device may be releasably locked, in container form, by means of engagement of said telescoped tubular elements to thereby be closed upon a free-riding ring that is seated about the tubular element with the length of the choker-collar extending through said slot and to the wearer animal to thereby prevent said ring from directly snagging itself to the animal's peril.

4,558,664

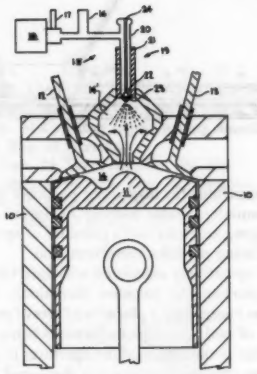
SUPERHEATED FUEL INJECTION FOR COMBUSTION OF LIQUID-SOLID SLURRIES

Franklin A. Robben, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,658

Int. Cl.⁴ F02B *45/02*

U.S. Cl. 123—23 **14 Claims**



1. A method for improving ignition and combustion of a liquid-coal slurry fuel comprising the steps of:

supplying the liquid-coal slurry fuel to an accumulator at a pressure greater than the pressure in an associated combustion chamber into which the fuel is to be injected;

heating the pressurized fuel in the accumulator to a superheated condition; and

injecting the superheated fuel into a combustion chamber having a pressure lower than the pressure in the accumulator, whereby causing flash boiling of at least a portion of the liquid component of the liquid-coal slurry fuel, resulting in a shattering of liquid droplets of fuel and separation of the liquid from the coal particles of the slurry fuel, thereby substantially preventing agglomeration of the coal particles during subsequent ignition and combustion thereof.

5. A superheated injection system for a liquid-coal slurry fuel comprising:

a high pressure accumulator,

means for supplying a liquid-coal slurry fuel under pressure to said accumulator,

means for heating said accumulator for causing the slurry fuel under pressure in said accumulator to be heated near a point of boiling of a liquid component of said slurry fuel,

means forming a nozzle at one end of said accumulator,

valve means positioned in said accumulator and adapted to control fuel flow through said nozzle means, and

means for actuating said valve means for injecting said heated high pressure fuel into an associated combustion chamber.

4,558,665

TURBO CHARGED COMBUSTION ENGINE WITH WATER INJECTION

Lars Sandberg, Gothenburg, and Björn Scheuer, Horred, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Aug. 29, 1984, Ser. No. 645,526

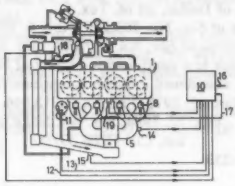
Claims priority, application Sweden, Sep. 9, 1983, 83048447

Int. Cl.⁴ F02M *25/02*

U.S. Cl. 123—25 C **7 Claims**

1. Turbo charged combustion engine comprising a plurality of cylinders, each cylinder having an inlet valve that opens to

admit a combustible mixture to the associated cylinder, means to supply a said combustible mixture to each said inlet valve, means to supply water to said cylinders, said water supply means comprising a separate water injection valve for each



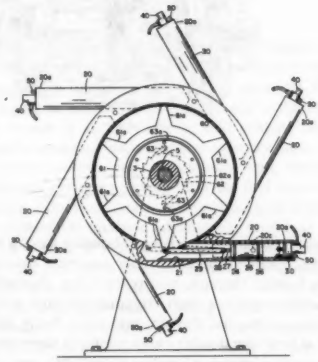
cylinder, said valves being directed toward the inlet valve of each cylinder, and a control unit for sequentially operating the water injection valves in synchronism with the opening and closing of the inlet valves.

4,558,666

ROTATING CYLINDER ENGINE AND METHOD OF OPERATING THE ENGINE

Wilbur A. Schaich, San Antonio, Tex., assignor to Centrifugal Piston Expander, Inc., San Antonio, Tex.

Filed Jul. 26, 1984, Ser. No. 634,846
Int. Cl.[4] F02B *57/00*
U.S. Cl. 123—43 R **23 Claims**



1. A gas pressure operated engine comprising a rotatable output shaft; a hollow housing secured to said output shaft for co-rotation and defining a chamber around the axis of said output shaft; at least one cylinder mounted on said housing with its axis in radially spaced, generally tangential relationship to the chamber; said cylinder having an open inner end communicating with said chamber and a closed outer end disposed exteriorly of said chamber; means in said closed end for supplying pressured gas to said cylinder; a piston reciprocably mounted in said cylinder for relative movement toward and away from said closed cylinder end; unidirectional clutch means mounted in said chamber; and means connecting said piston to said unidirectional clutch means to prevent movement of said piston in the direction away from said closed cylinder end but permit unobstructed movement of said piston toward said closed cylinder end, whereby said closed cylinder end moves away from said piston upon introduction of gas pressure in said closed end of said cylinders; and means for maintaining an above ambient gas pressure in said chamber sufficient to return said piston to said closed cylinder end.

21. The method of extracting mechanical energy from a pressured gas supplied to a plurality of linearly reciprocable piston and cylinder units comprising the steps of:

(1) disposing the cylinders in peripherally spaced relation about the axis of a rotatable housing defining a chamber, and tangential thereto; said cylinders each having an outer closed end and an inner open end communicating with said chamber;

(2) connecting the pistons to a unidirectional clutch mounted in said chamber to prevent movement of said pistons away from the respective closed cylinder ends, but permitting unrestricted relative movement of said pistons toward said closed cylinder ends;

(3) introducing a pressurized gas in said closed cylinder ends and permitting said gas to expand and cool, thereby producing rotational movement of said cylinders and housing in one direction;

(4) exhausting said cooled and expanded gas to ambient pressure as said pistons approach said inner ends of said respective cylinders; and

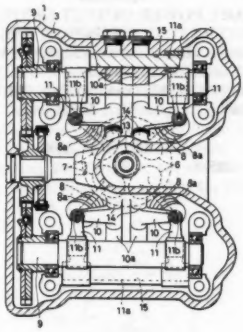
(5) maintaining an above ambient gas pressure in said chamber sufficient to return said pistons to said closed ends of the respective cylinders.

4,558,667

VALVE DRIVING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Takashi Inagaki, Kawagoe; Yasumasa Fujita, Asaka, and Shinichiro Izawa, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,368
Claims priority, application Japan, Jul. 23, 1982, 57-127567; Jul. 23, 1982, 57-110982; Aug. 12, 1982, 57-139124; Aug. 12, 1982, 57-139125; Aug. 12, 1982, 57-121617
Int. Cl.[4] F01L *1/18*
U.S. Cl. 123—90.44 **6 Claims**



1. A valve driving apparatus in an internal combustion engine having plural valve stems for each cylinder in a cylinder head on an upper portion of a main body of the engine which are aligned radially about the cylinder head with the intersection of their longitudinal axes substantially coinciding with a center of curvature of an upper wall surface of a combustion chamber, the cylinder head including a lower half portion having the valve stems therein and an upper half portion constituted by a detachable head cover; the valve driving apparatus including:

at least one cam shaft rotatably clamped in between the lower half portion of the cylinder head and the head cover,

a plurality of subsidiary rocker arms, each having one end in abutment with a head of one of the valve stems,

subsidiary rocker arm shafts, each pivotally mounting one of the subsidiary rocker arms and being inserted in and supported by a bearing bore formed directly in one of the

lower half portion and the upper half portion of the cylinder head, each shaft having a center axis positioned in a plane which crosses a longitudinal axis of the corresponding one of the valve stems at a right angle and which also is substantially located to include a mid-point of a range of up and down stroke of the head of the valve stem,

a plurality of respective rocker arms driven by said at least one cam shaft and driving the subsidiary rocker arms, and

respective rocker arm shafts pivotally mounting the respective rocker arms and each being inserted in and supported by at least one bearing bore formed directly in one of the lower half portion and the upper half portion of the cylinder head;

at least one pair of the subsidiary rocker arms which are in abutment with a corresponding pair of valve stems being positioned between the corresponding pair of valve stems, the subsidiary rocker arm shafts mounting said at least one pair of subsidiary rocker arms being disposed in parallel with one another and in parallel with a plane at right angles with the corresponding respective rocker arm shaft.

4,558,668

AUXILIARY POWER OUTPUT DEVICE FOR AN INTERNAL COMBUSTION ENGINE

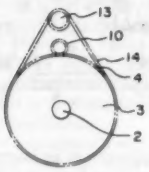
Kiyoshi Yabunaka, Himeji, Japan, assignor to Mitsubishi Denki Kabusiiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,151

Claims priority, application Japan, Oct. 19, 1983, 58-162290[U]

Int. Cl.⁴ F02F *7/00*

U.S. Cl. 123—195 A **2 Claims**



1. In an internal combustion engine having a crankshaft, a ring gear fixed to a flywheel of said crankshaft and a starter motor including a pinion having a diameter substantially less than said ring gear and means for selectively engaging said starter motor pinion with said ring gear, an auxiliary power output device comprising:

an auxiliary power output shaft driving an auxiliary device;

a pulley fixed to said output shaft; and

a belt drivingly wound between said ring gear and said pulley, wherein said ring gear, said starter motor and said pulley are relatively positioned such that said starter motor pinion is spaced from and surrounded by said belt and is directly engageable with said ring gear at a circumferential position where said belt does not wind around said ring gear.

4,558,669

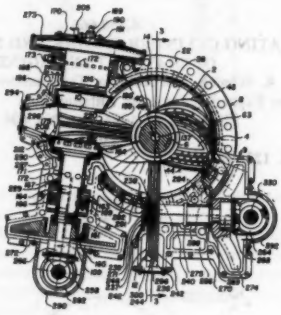
IGNITION APPARATUS FOR A ROTARY INTERNAL COMBUSTION ENGINE

Gail W. Kemp, Dallas, Tex., assignor to Vida M. Kemp, Dallas; Phillis J. Carter, Richardson; Ruth E. Kemp and Allan E. Kemp, both of Dallas, all of, Tex.

Continuation of Ser. No. 203,965, Nov. 4, 1980, abandoned, which is a division of Ser. No. 857,208, Dec. 5, 1977, Pat. No. 4,239,469, which is a continuation-in-part of Ser. No. 779,172, Mar. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 544,427, Jan. 27, 1975, Pat. No. 4,013,046. This application Feb. 27, 1984, Ser. No. 582,870

Int. Cl.⁴ F02B *53/00*

U.S. Cl. 123—233 **20 Claims**

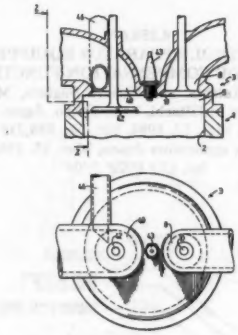


1. A rotary machine comprising: a housing having a circular working space formed therein; at least one rotor having at least one piston formed thereon, said rotor being disposed in said circular working space; a shaft extending through said housing and rotatably supported therein, said rotor being secured to said shaft; at least one divider valve rotatably supported in said housing, said divider valve forming at least one working cycle space in the circular working space of the housing; a hub rotatably supported in said housing in spaced relationship to said divider valve and through an opening into the working space to divide the working cycle space into an intake compression space and an expansion exhaust space, said hub having a disc-shaped body formed thereon, said disc-shaped body being radially tapered inwardly toward the periphery of said valve, said hub having a combustion chamber formed therein, the combustion chamber having compression passages formed in one side of the disc-shaped body in the hub and expansion passages formed on the opposite side of the disc-shaped body in the hub and adapted to substantially alternately communicate with the circular working space in the housing through ports in the housing; a combustion including means secured in the combustion chamber wall; a rotating terminal; ignition circuit means connecting said combustion including means to said rotating terminal and arranged to rotate with said compression-expansion valve; a non-rotating terminal secured to said housing arranged to provide continuous ignition circuit connection between the rotating terminal and the non-rotating terminal; and means to supply ignition energy to said rotating terminal means through said non-rotating terminal.

4,558,670
INTERNAL COMBUSTION ENGINE

John M. Trihey, 89 Kalinda Rd., Ringwood, Victoria, Australia

PCT No. PCT/AU82/00086, § 371 Date Jan. 21, 1983, § 102(e) Date Jan. 21, 1983, PCT Pub. No. WO82/04285, PCT Pub. Date Dec. 9, 1982
Continuation-in-part of Ser. No. 202,030, Oct. 29, 1980, abandoned, which is a division of Ser. No. 861,929, Dec. 19, 1977, Pat. No. 4,249,495. This PCT application May 28, 1982, Ser. No. 463,452
Claims priority, application Australia, May 29, 1981, PE9111
Int. Cl.⁴ F02B *17/00, 29/00, 31/00;* F02F *1/42*
U.S. Cl. 123—308 2 Claims



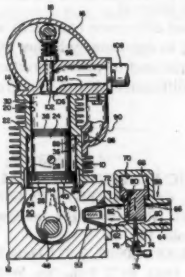
1. A method of operating an internal combustion engine having a cylinder and piston reciprocally mounted therein, said method including egressing combustion products from the cylinder during an exhaust stroke, admitting to the cylinder a tangential stream of air only during said exhaust stroke at a pressure and direction relative to the cylinder such that said stream of air circulates against the cylinder wall, introducing a combustible mixture of a working fluid and fuel into said cylinder during an induction stroke, maintaining said stream of air and said combustible mixture substantially stratified during a compression stroke, in which the engine includes an exhaust duct and an exhaust valve for opening and closing same to said cylinder and in which the step of admitting to the cylinder a tangential stream of air includes routing the air stream through a pipe protruding, as seen in plan, transversely into said exhaust duct adjacent to and generally tangentially of said cylinder wall, and avoiding exhaust flow into said pipe when said exhaust valve is open by providing the pipe at its outlet with an angular end having its longer face upstream of the exhaust flow and its outlet facing downstream of exhaust flow.

4,558,671
SUPERCHARGED ENGINE

Donald E. Stinebaugh, 232 N. Corbin Rd., Post Falls, Id. 83854

Continuation-in-part of Ser. No. 504,890, Jun. 16, 1983, abandoned. This application Jul. 13, 1983, Ser. No. 513,465
Int. Cl.⁴ F02B *33/14, 75/02*
U.S. Cl. 123—317 12 Claims

1. In a four-cycle internal combustion engine,
a housing including a cylinder having a first portion with a first diameter and a second coaxial portion with a second and larger diameter,
a stepped piston having a first smaller diameter portion slidably received in the first portion of said cylinder, and a second larger diameter portion joined to the first at a stepped shoulder so as to be simultaneously slidably received in the second portion of said cylinder,
a combustion chamber defined in said housing adjacent the end of the small diameter portion of the piston,
a crankcase chamber defined in said housing opposite the larger diameter end of the piston,
an intermediate annular chamber within the larger diameter cylinder portion around the smaller diameter piston portion, said annular chamber being variable in volume according to the position of said stepped shoulder of the larger diameter portion of said piston,
means for introducing gas into said intermediate annular

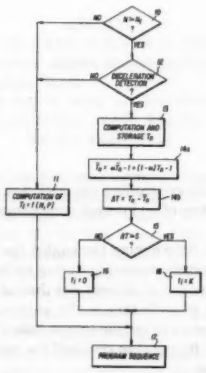


chamber for compression therein, said gas introducing means further including means for introducing gas at substantially atmospheric pressure into said crankcase chamber,
means for coupling compressed gas from said intermediate annular chamber into said crankcase chamber to mix with the gas previously introduced therein, and
means for introducing compressed gases from said crankcase chamber into said combustion chamber.

4,558,672
PROCESS FOR SHUTOFF OF FUEL INJECTION DURING THE DECELERATION PHASES OF AN INTERNAL COMBUSTION ENGINE

Yves Boccadoro, Feucherolles, and Bernard Lepretre, Boulogne Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed May 14, 1984, Ser. No. 609,863
Claims priority, application France, May 13, 1983, 83 07971
Int. Cl.⁴ F02D *5/00*
U.S. Cl. 123—325 4 Claims



1. A process for shutoff of fuel injection in the deceleration phases of an internal combustion engine whereby fuel injection is interrupted in response to detection of a deceleration and

fuel injection is restarted when a threshold linked to the engine speed is reached, comprising the steps of:

measuring the engine speed (N) or period of rotation (T) from consecutive equal intervals or angles of rotation of said engine;

computing the difference (ΔN, ΔT) between the speed or period (N_n, T_n) measured from the last angular interval and the value ($\overline{N}_n$, $\overline{T}_n$) fed through a high-pass filter of the speed or period (N_{n-1}, T_{n-1}) measured from the preceding angular interval;

comparing said difference (ΔN, ΔT) with a fixed threshold (S) in order to determine whether engine deceleration has been detected and to provide restarting of fuel injection when said difference (ΔN, ΔT) is greater than said threshold (S).

4,558,673

ELECTRONIC IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

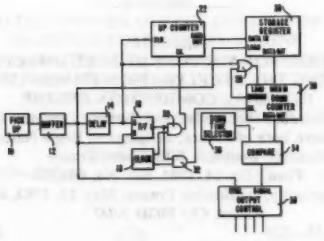
Ronald D. Mackie, Pensacola, Fla., assignor to Nutek, Incorporated, Pensacola, Fla.

PCT No. PCT/US82/00900, § 371 Date Mar. 4, 1983, § 102(e) Date Mar. 4, 1983, PCT Pub. No. WO83/00192, PCT Pub. Date Jan. 20, 1983

Continuation-in-part of Ser. No. 280,033, Jul. 2, 1981, abandoned. This PCT application Jul. 2, 1982, Ser. No. 475,680

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—416 **18 Claims**



1. Apparatus for controlling the initiation of ignition sparks within the cylinders of an internal combustion engine comprising:

first means for determining the engine speed during each of n timing intervals occurring during each revolution of the engine, where n is an integer less than or equal to one-half the number of cylinders in the engine, said first means being responsive to engine speeds below a preset level for causing n to be equal to one-half the number of cylinders in the engine;

second means responsive to the engine speed during each timing interval for determining the time for the initiation of the ignition sparks during the immediately subsequent timing interval; and

third means for generating sparks initiating pulses at the times determined by said last-named means.

4,558,674

KNOCK CONTROL APPARATUS EQUIPPED WITH ALTITUDE COMPENSATION FUNCTION

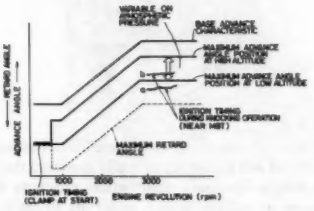
Terumi Okado, Katsuta, and Noboru Sugiura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,215

Claims priority, application Japan, Mar. 15, 1983, 57-43713

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—425 **9 Claims**



1. A knock control apparatus equipped with an altitude compensation function, comprising:

a knock sensor fitted to an internal combustion engine for detecting the mechanical oscillation of said internal combustion engine caused by knocking to produce a signal indicating the intensity of knock;

an atmopsheric pressure sensor detecting the atmospheric pressure;

means for discriminating a background level signal from the output signal from said knock sensor;

means for comparing the output signal from said knock sensor with the background level signal from said discrimination means and detecting the knock of said internal combustion engine and the intensity of said knock;

means for generating a signal representing a maximum advance angle position in accordance with a detected atmospheric pressure; and

ignition timing control means for setting and generating a first ignition timing signal representing the maximum advance angle position corresponding to the detected atmospheric pressure when no knocking in the internal combustion engine is occurring, and for generating a second ignition timing signal representing an advance angle position retarded from the maximum advance angle position changing with a predetermined retard angle changing speed in accordance with the detected knocking intensity when knocking in the internal combustion engine is occurring, the second ignition timing singal changing gradually toward the first ignition timing signal corresponding to the detected atmospheric pressure with a predetermined advance angle changing speed while changing away from the first ignition timing signal with the predetermined retard angle changing speed in accordance with a detected knocking intensity.

4,558,675

ELECTRONIC IGNITION SYSTEM FOR GASOLINE INTERNAL COMBUSTION ENGINES

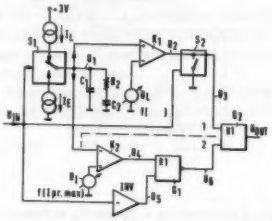
Willy Minner, Schwaigern; Heinz-Hermann Spies, and Christoph Dömland, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,802

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3328951

Int. Cl.[4] F02P 7/077

U.S. Cl. 123—427 8 Claims



1. An electronic ignition system for a gasoline internal combustion engine having a plurality of cylinders each containing a piston and an ignition element, a crankshaft connected to the pistons to be rotated by movement of the pistons in their respective cylinders, and a primary coil connected to supply ignition current to each ignition element, said system comprising a Hall sensor connected for generating a reference signal corresponding to the position of one of the crankshaft and pistons, and means for deriving control information for electronically controlling the moment of supply of ignition current to each ignition element in dependence upon the speed of and the load on the engine, said means comprising: a capacitor unit connected to be alternately charged and discharged under control of the reference signal for producing a first electrical signal constituting an information signal; means for supplying a second electrical signal constituted by a first d.c. voltage; voltage altering means connected for altering the voltage value of one of the first and second signals in dependence upon engine load; first comparator means connected for comparing that one of said first and second signals which is altered by said voltage altering means with the other one of said first and second signals for producing a signal for controlling the moment of supply of ignition current to each ignition element; means for supplying a third electrical signal constituted by a second d.c. voltage; means, connected to said means for supplying a third electrical signal, for altering the value of the third signal in dependence upon the duration of the current flowing through the primary coil when that current has its maximum value; and second comparator means connected for comparing the first signal with the altered third signal in order to determine the moment at which current begins to flow through the primary coil.

4,558,676

TWO-CYLINDER, FOUR-STROKE-CYCLE, DOUBLE-PISTON ENGINE, ESPECIALLY AIR-FLOW-COOLED FOR MOTORCYCLES

Jiri Seidl, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

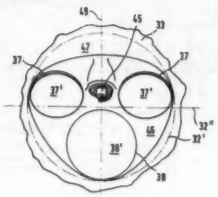
PCT No. PCT/EP82/00133, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/00188, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 24, 1982, Ser. No. 474,595

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125077

Int. Cl.[4] F02M 13/06

U.S. Cl. 123—432 3 Claims



1. A cylinder head for four-stroke-cycle internal-combustion engines, having inlet and outlet valves supsended in V-position in the cylinder head, in which case, for each cylinder, two inlet valves are arranged parallel to one another, their shafts corresponding to one V-leg, and one outlet valve is arranged approximately therebetween the shaft of which corresponds to a second V-leg and substantially equidistant from the inlet valves and in a plane containing the cylinder axis, characterized in that

the V-position of the inlet and outlet valve shafts is disposed such that the outlet valve shaft enclose an angle of about 0° to 20° with the cylinder axis, the plane determined by the inlet valve shafts enclosing an angle of about 30° to 50° with the cylinder axis, an area lying substantially between the inlet valves which encompasses the plane determined by the outlet valve shaft and the cylinder axis,

a spark plug arranged within said area, and

the valve disks of the inlet valves in their closing position overlap a plane of the cylinder cross-section containing the axis of the cylinder and that is located substantially equidistant from the centers of the valve disks of the inlet valves.

4,558,677

AIR-FUEL RATIO CONTROL SYSTEM

Kazuo Hara, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,673

Claims priority, application Japan, Aug. 11, 1983, 58-146864

Int. Cl.[4] F02M 7/12

U.S. Cl. 123—440 4 Claims

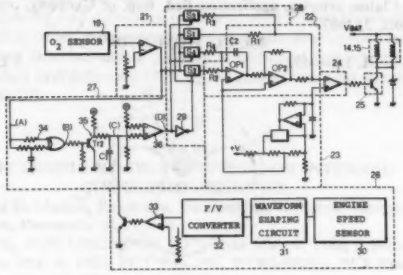
1. An improved air-fuel ratio control system for a vehicle powered by an internal combustion engine having an induction passage, air-fuel mixture supply means, an electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by said means, an O_2 sensor for detecting oxygen concentration in exhaust gases, a first conparator for comparing the output of said O_2 sensor with a reference value and for producing an output signal relative to the comparison, and a feedback control circuit responsive to the output of said comparator for producing a control output signal for driving said electromagnetic valve for correcting the air-fuel ratio; wherein the improvement comprises

means comprising an air-fuel ratio deviation detecting circuit responsive to the output signal of said first comparator for producing an output signal when the output signal

of said comparator exceeds a predetermined condition at a transient state of the driving of said vehicle;

means responsive to said output signal of said air-fuel ratio deviation detecting circuit for changing circuit constants of said feedback control circuit so as to expedite the operation of the feedback control circuit,

a driving condition detecting circuit for disabling said air-fuel ratio deviation detecting circuit at a predetermined driving condition,



said driving condition detecting circuit comprises a circuit responsive to ignition pulses of the engine for producing an engine speed signal, first comparator means for producing an engine low speed when the engine speed signal is lower than a predetermined value, and means responsive to said engine low speed signal for disabling said air-fuel ratio deviation detecting circuit.

4,558,678

FUEL FEEDING APPARATUS FOR INTERNAL COMBUSTION ENGINE

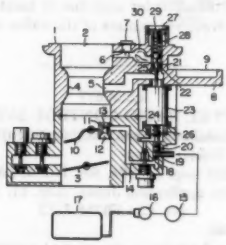
Yutaka Nishimura, Katsuta; Hiroshi Kuroiwa, Hitachi; Yoshishige Oyama, Katsuta, and Takao Teranishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,342

Claims priority, application Japan, Feb. 10, 1982, 57-20267

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—494 **6 Claims**



1. A fuel feeding apparatus for internal combustion engines, the fuel feeding apparatus comprising: an air-intake passage provided with a venturi portion therein; a throttle valve disposed in the portion of said air intake passage downstream of said venturi portion as viewed in a direction of flow of the intake air; a fuel injection portion disposed in the portion of said air intake passage between said throttle valve and said venturi portion; a bypass air passage opening into and interconnecting a portion of said intake passage upstream from said venturi portion and said venturi portion; a heat-type air flow meter disposed in said by-pass air passage for detecting the change of flow rate of air flowing in said bypass air passage; a backward flow suppression means disposed in the portion of said bypass air passage downstream from said heat-type air flow meter for suppressing a backflow component of air by disrupting the air flow downstream of the air flow meter while permitting a forward flow component to smoothly pass therethrough.

4,558,679

METHOD OF CONTROLLING HYDRAULIC ACTUATOR

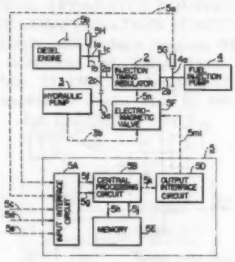
Yuzo Koyanagi, Warabi, Japan, assignor to Sanwa Seiki Mfg., Co., Ltd., Yono, Japan

Filed Nov. 3, 1981, Ser. No. 317,602

Claims priority, application Japan, Nov. 7, 1980, 55-155771; Nov. 26, 1980, 55-166200; Sep. 25, 1981, 56-151614

Int. Cl.⁴ F02M *59/20*

U.S. Cl. 123—502 **6 Claims**



1. A method of controlling a hydraulic actuator wherein the deviation between a controlled resultant value and a reference command signal is minimized by the application of a digital pulse signal to said actuator, comprising the steps of:

detecting an initial temperature substantially corresponding to the temperature of the hydraulic oil used in a hydraulic control;

comparing said initial temperature with a predetermined temperature;

storing a period ts which is negatively proportional to said initial temperature in a memory as a pulse width t of said digital pulse signal, when said initial temperature is lower than said predetermined temperature;

storing a predetermined basic period tso in said memory as a pulse width t of said digital pulse signal, when said initial temperature is highter than or equal to said predetermined temperature;

initially detecting an actual condition factor Pe of said actuator and comparing said actual condition factor Pe with a command condition factor Pθo to determine a deviation Er between said factors;

comparing the absolute value of the deviation Er with a predetermined minimum deviation value Ero;

outputting a digital pulse signal having a pulse width t to said actuator, when said absolute value of the deviation Er is greater than said predetermined minimum deviation value Ero;

again detecting the actual condition factor Pθ of said actuator and comparing said actual condition factor Pθ with a command condition factor Pθo to obtain a deviation Er between said factors;

comparing the absolute value of the deviation Er with said predetermined minimum deviation value Ero;

comparing said absolute value of the deviation Er with a predetermined maximum deviation value Er_1, when said absolute value of said deviation Er is greater than said predetermined minimum deviation value Ero;

continuously outputting said digital pulse signal to said actuator, when and so long as said absolute value of the deviation Er is greater than said predetermined maximum deviation value Er_1, detecting the actual condition factor to determine the deviation Er between said actual condi-

tion factor Pθ and said command condition factor Pθo, and comparing the thus obtained deviation Er with said predetermined maximum deviation value Er_1;

adding a period proportional to said absolute value of the deviation to said predetermined basic period tso so as to obtain a pulse width t of said digital pulse signal, when said absolute value of said eviation Er is less than said predetermined maximum deviation Er_1; and

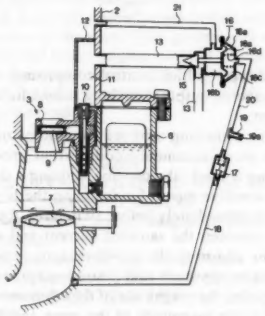
outputting said digital pulse signal having a pulse width t to said actuator.

4,558,680

SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A SUPERCHARGED ENGINE

Kazuo Nakazato, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 579,066
Claims priority, application Japan, Feb. 14, 1983, 58-022566
Int. Cl.[4] F02M *7/12*
U.S. Cl. 123—559 **10 Claims**



1. A system for controlling the air-fuel ratio supplied to a combustion engine having an intake passage communicting with the engine, an air-cleaner provided in the intake passage, a carburetor upstream of the engine in the intake passage having a main nozzle, and an air bleed communicated with the main nozzle and a throttle valve in the intake passage downstream of the main nozzle, an exhaust passage communicating with the engine and a supercharger comprising a compressor provided in the intake passage between the air-cleaner and said carburetor, comprising:

a first passage communicating said air bleed adjacent to an inlet of said air bleed with a portion of said intake passage extending from said air-cleaner to said compressor;

valve means provided in said first passage for closing the latter;

an actuator comprising first and second chambers defined by a diaphragm operatively connected to said valve means;

a second passage communicating said first chamber with said intake passage upstream of said inlet of said air bleed;

a third passage communicating said second chamber with said intake passage downstream of said throttle valve; and

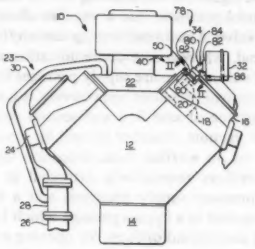
said actuator being so arranged that said valve means opens said first passage when a difference between pressures in said first and second chambers exceeds a predetermined value.

4,558,681

EXHAUST GAS AND BLOW-BY RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Bhaskar Mookerjee, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 17, 1984, Ser. No. 611,442
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—568 **9 Claims**



2. An exhaust gas and blow-by recirculation system for an internal combustion engine, said engine including a crankcase, a combustion chamber, a cylinder head having an air intake passage connected to the combustion chamber, an intake manifold connected to said passage at an end remote from the combustion chamber, and a crankcase ventilation valve, the improvement comprising:

means for directing a portion of the engine exhaust into the intake manifold; and

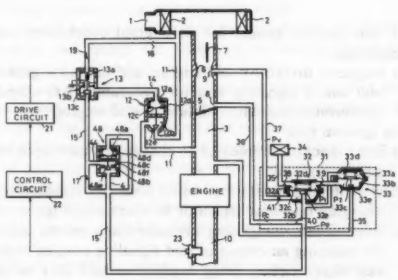
means for communicating the blow-by gases from said crankcase to said passage in the cylinder head through the crankcase ventilation valve, said communicating mes is including a bore in the cylinder head through wi ch blow-by is communicated directly into the passage.

4,558,682

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Shumpei Hasegawa, Niiza, and Michitaka Shiraiwa, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,743
Claims priority, application Japan, Mar. 17, 1983, 58-045056; Mar. 19, 1983, 58-046923; Mar. 19, 1983, 58-046922
Int. Cl.[4] F02M *23/04*
U.S. Cl. 123—589 **13 Claims**



4. An air intake side secondary air supply system for an internal combustion engine, comprising:

an air control valve disposed in a secondary air passage leading to an intake air passage of the engine, downstream of a throttle valve;

a detection means for detecting an air/fuel ratio from a composition of an exhaust gas of the engine, and generating an air/fuel ratio detection signal;

a source of a first control pressure for opening said air control valve;

a source of a second control pressure for closing said air control valve; and

a communication means responsive to said air/fuel ratio detection signal for introducing one of said first and second control pressures into a vacuum chamber of said air control valve in accordance with said air/fuel ratio detection signal, wherein said communication means includes first and second pressure supply passages for said first and second control pressures respectively, a control valve for supplying one of said first and second control pressures into said vacuum chamber of said air control valve, according to an air/fuel ratio detection signal, first and second orifices respectively provided in said first and second pressure supply passages, and a bypass control valve disposed in a bypass passage which bypasses one of said first and second orifices, for opening and closing said bypass passage according to operational conditions of the engine.

4,558,683

IGNITION SYSTEM IN INTERNAL COMBUSTION ENGINE

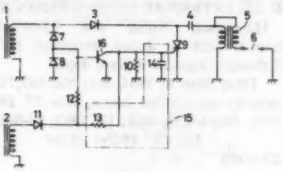
Hiroshi Okuda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 545,976, Oct. 27, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,463

Claims priority, application Japan, Oct. 27, 1982, 57-190639; Jun. 22, 1983, 58-113174

Int. Cl.[4] F02D *3/06*

U.S. Cl. 123—599 **7 Claims**



1. An ignition system for an internal combustion engine, comprising:

a magneto, driven by said engine, and having a generating coil and a signaling coil for generating AC outputs in synchronization with rotation of said engine;

an ignition coil;

a first capacitor coupled to be charged by an output of said generating coil;

first switching means for, when rendered conductive, discharging said first capacitor to operate said ignition coil;

a delay circuit, comprising a resistor and a second capacitor, for delaying an output of said signaling coil, an output of said delay circuit being applied to said first switching means to render said first switching means conductive; and

second switching means for, after said first capacitor is discharged and in response to outputs of said generating coil and said signaling coil, resetting said delay circuit to fully discharge said second capacitor each time said first capacitor is discharged.

4,558,684

INTERNAL COMBUSTION ENGINE COIL-TYPE IGNITION CONTROL

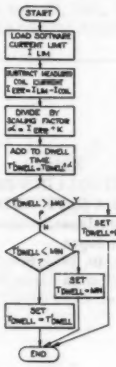
Stephen W. Caddy, Handsworth Wood, and Michael Holmes, Kings Heath, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jul. 19, 1984, Ser. No. 632,428

Claims priority, application United Kingdom, Jul. 21, 1983, 8319694

Int. Cl.[4] F02P *3/045, 3/05*

U.S. Cl. 123—609 **4 Claims**



1. A coil-type ignition control comprising:

semiconductor output switching means for controlling coil current;

means for switching said semiconductor output switching means on to commence coil current growth and off for creating a spark, the on time defining a dwell time; and

current sensitive means for sampling the level of current in the coil immediately before switch off, for calculating the error between the sampled current and a desired value, and for adjusting the dwell time to cause the final coil current to approach said desired value in successive ignition cycles, the magnitude of the adjustment being proportional to the magnitude of the error, the final coil current being capable of exceeding said desired value and being regulated to said desired value solely by adjusting said dwell time in normal running conditions.

4,558,685

ENGINE IGNITION DEVICE

Yasuki Ishikawa, Orlando, Fla.; Masazumi Sone, Tokyo, and Akio Kawai, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 4, 1984, Ser. No. 596,794

Claims priority, application Japan, Apr. 4, 1983, 58-57792

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—620 **4 Claims**

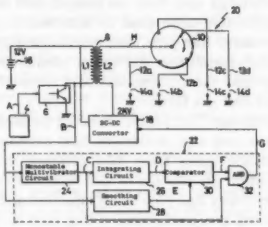
1. An engine ignition device comprising an ignition coil having primary and secondary windings, an ignition circuit with a switching means for generating a voltage having a high absolute value in the secondary winding of the ignition coil through switching an electric current flowing in the primary winding of the ignition coil by producing a primary ignition signal, a DC-DC converter connected to the secondary winding for boosting and supplying the generated voltage having a high absolute value to ignition plugs to prolong the discharge duration of the ignition plugs, and a DC-DC converter controlling circuit for controlling the DC-DC converter to initiate ignition synchronously with said primary ignition signal and to reduce the operating time of the DC-DC converter as the

engine increases its speed, wherein said DC-DC converter controlling circuit comprises:

a smoothing circuit for receiving the primary ignition signal from the switching means and generating an output whose absolute value is higher when the engine speed is lower and lower when the engine speed is higher;

a monostable multivibrator circuit for receiving the primary ignition signal and generating an output having a fixed time duration;

an integrating circuit for receiving the output from the monostable multivibrator circuit;



a comparator for receiving outputs from both the smoothing circuit and the integrating circuit, comparing them with each other and generating an output when the absolute value of the output of the smoothing circuit is higher than that of the output of the integrating circuit; and

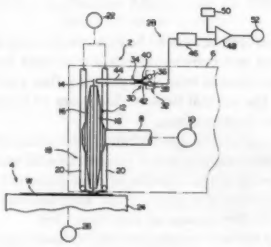
an AND circuit for producing a pulsed output whose absolute value rises with the start of the ignition and which has a larger width for lower engine speed in response to the outputs from the comparator and the monostable multivibrator circuit, and for transmitting to the DC-DC converter said pulsed output.

4,558,686

MACHINING DEVICE EQUIPPED WITH BLADE INSPECTING MEANS

Takatoshi Ono, Nagareyama, Japan, assignor to Disco Abrasive Systems, Ltd., Japan

Filed Jan. 30, 1984, Ser. No. 574,814
Claims priority, application Japan, Feb. 7, 1983, 58-17070[U]
Int. Cl.⁴ B28D *1/04*
U.S. Cl. 125—13 R **10 Claims**



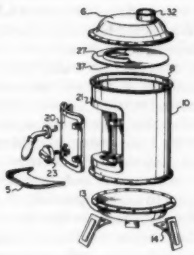
1. A machining device comprising a rotatable machining tool mounted for rotation about a central axis as a center; a blade on said rotatable machining tool; a driving source for rotating said rotatable machining tool; a holding member for holding a workpiece, said holding member and said machining tool being adapted to be moved relative to each other to permit the blade to act on a workpiece held by the holding member as the machining tool rotates; cooling liquid impinging means for impinging a cooling liquid against the blade and the workpiece; blade inspecting means including emitting means for emitting electromagnetic radiation and receiving means for receiving the electromagnetic radiation from the emitting means and producing a signal corresponding to the received electromagnetic radiation, said emitting means and receiving means being disposed such that the electromagnetic radiation emitted from the emitting means undergoes interference by the blade of the machining tool and the electromagnetic radiation received by the receiving means is varied according to the condition of the blade; and gas stream generating means for generating a gas stream in the path of the electromagnetic radiation between the emitting means and the receiving means and the blade or in the vicinity of said path, said gas stream preventing fog generated by impinging of the cooling liquid and dust formed by machining the workpiece from floating in the path.

4,558,687

STOVE

Michael Minshall, Toronto; Brian Park, Eganville; Carlos Etchegoyen, Mississauga, and Bert Babrovniczky, Don Mills, all of Canada, assignors to Spacemaker Limited, Canada

Filed Mar. 16, 1982, Ser. No. 358,817
Claims priority, application Canada, Mar. 16, 1981, 373064
Int. Cl.⁴ F24C *1/16*
U.S. Cl. 126—59 **7 Claims**



1. A freestanding stove comprising a body section, a top section having a combustion gas outlet, a bottom section, a baffle means and a draft regulating means,

said body section being cylindrical in shape;

said top and bottom sectons each being substantially frustoconical and being, for transport or storage purposes, adapted to nest within said body section;

said top section adapted to be secured to one end of said body section and said bottom section adapted to be secured to the opposite end of said body section,

said baffle means being located between said body section and said top section whereby said bottom section, said body section and said baffle means together define a primary combustion chamber and said top section and said baffle means together define a secondary combustion chamber;

said draft regulating means comprising at least one adjustable vent opening operable to regulate the flow of air to said combustion chambers;

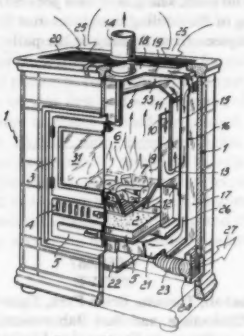
said baffle means including an arcuate opening to permit the flow of air from said primary combustion chambers to said secondary combustion chamber, an arcuate heat shield in front of said arcuate opening and a dimple for collecting creosote.

4,558,688

FIREPLACE-HEATER WITH FULL RECOVERY OF HOT AIR

Domenico Piazzetta, Casella d'Asolo, Italy, assignor to Piazzetta S.p.A., Casella d'Asolo, Italy

Filed Aug. 15, 1983, Ser. No. 523,488
Claims priority, application Italy, Aug. 27, 1982, 30785/82[U]
Int. Cl.[4] F24B *3/00*; F24C *15/30*
U.S. Cl. 126—67 **3 Claims**



1. A fireplace heater comprising a combustion chamber with a bottom including a brazier and a substantially horizontal ceiling, opposite to said bottom, first sidewalls extending substantially vertically from said bottom of said combustion chamber but ending short of said substantially horizontal ceiling thereby forming a top side opening, said substantially horizontal ceiling being connected laterally to second vertical walls at the upper ends thereof, said second vertical walls being located parallely outside of said first walls forming a first flue gas chamber therebetween, additional sidewalls located parallely outside of said second vertical sidewalls and further forming a second flue gas chamber therebetween, a horizontal plate, in communication with a flue, associated laterally with the upper ends of said additional sidewalls thereby closing said second flue gas chamber at its upper end, said horizontal plate being substantially parallel to said substantially horizontal ceiling and defining a third flue gas chamber therebetween, said additional sidewalls extending below said brazier and communicating thereat to form a space below said combustion chamber, an ash collecting tray removably housed, in said space, a back plate rearwardly closing, said first, second, and third flue gas chambers, and said combustion chamber baffles, provided between the faces of said additional sidewalls and said first vertical walls, located at a distance below the lower ends of said second vertical walls, thereby creating a bottom side opening, forcing the flue gasses to reverse their direction of movement.

4,558,689

COMBUSTION GAS HEAT RECOVERY APPARATUS

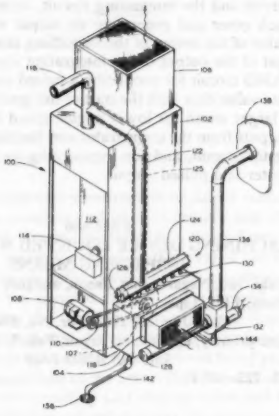
Artie McCann, 12783 McKinley Rd., Orient, Ohio 43146

Filed Jun. 25, 1984, Ser. No. 623,906
Int. Cl.[4] F24H *3/12, 3/02*
U.S. Cl. 126—117 **2 Claims**

1. Combustion gas heat recovery apparatus for installation on an existing forced air gas or oil fired furnace having a primary heat exchanger including a gas or oil burner, a primary flue pipe for carrying heated combustion gases from said primary heat exchanger to a primary gas exhaust flue, a cold air return plenum, and a primary blower for drawing air to be heated from said cold air plenum and forcing it through said primary heat exchanger from which it is distributed within the structure heated by said furnace, said apparatus comprising:

a secondary heat exchanger defining a combustion gas passage and a fresh air passage for air to be heated, which passages are isolated from one another, said secondary heat exchanger being positioned such that air drawn from said cold air return plenum is initially drawn through said secondary heat exchanger to be preheated by extracting heat from said combustion gases prior to being forced through said primary heat exchanger, said secondary heat exchanger comprising a combustion gas inlet plenum, a combustion gas outlet plenum, a plurality of heat conducting pipes sealingly connected between said inlet plenum and said outlet plenum, each of said heat conducting pipes being arranged in a serpentine pattern to define a plurality of linear radiating surfaces aligned in the direction of air flow through said heat exchanger, and heat conducting fins intimately connected to said heat conducting pipes, said primary flue pipe, said combustion gas inlet plenum and said combustion gas outlet plenum having approximately the same cross-sectional area to permit unrestricted flue gas flow;

a heat recovery flue pipe connected between said primary flue pipe and said secondary heat exchanger for passing combustion gases from said primary flue pipe to said combustion gas passage of said secondary exchanger, said heat recovery flue pipe being insulated and nonintrusively connected into said primary flue pipe such that the preheating of air by said secondary heat exchanger is maximized and free access to heated combustion gases is provided, but not substantial portion of said heat recovery flue pipe extends into said primary flue pipe to thereby obstruct the normal flow of flue gases or accumulate soot and other contaminants;



a cooled combustion gas exhaust pipe connected between said combustion gas outlet plenum of said secondary heat exchanger and the outside of said structure for passing cooled combustion gases from said secondary heat exchanger to the outside of said structure.

a secondary blower coupled to said exhaust pipe and operable to draw heated combustion gases from said primary flue pipe through said heat recovery flue pipe and secondary heat exchanger, and to exhaust cooled combustion gases received from said secondary heat exchanger to the outside of said structure through said exhaust pipe; and

condensate drainage means coupled to said secondary heat exchanger for draining condensate formed within said combustion gas heat recovery apparatus, said condensate drainage means comprising interconnected taps along the lower extremities of said heat conducting pipes and a condensate trap to permit condensate to drain from said secondary heat exchanger but prevent air or other fluids from being drawn into said apparatus.

4,558,690

METHOD OF ADMINISTRATION OF CHEMOTHERAPY TO TUMORS

Patrick J. Joyce, Arlington, Va., assignor to University of Scranton, Scranton, Pa.

Filed Jan. 26, 1982, Ser. No. 343,011
Int. Cl.[4] A61B *19/00*; A61M *5/00*
U.S. Cl. 128—1 R 9 Claims

1. A method for treatment of tumors of animals and humans which comprises:

(a) elevating the temperature of the tumor with exposure to a nonionizing radiofrequency field to partially necrose and attenuate its cells,

(b) injecting intratumorally and extracellularly into the tumor interstices a therapeutic dose of a tumoricidal agent encapsulated with a polymeric coating of a biologically inert thermoplastic resin characterized as having a melting point higher than the temperature of the surrounding body tissue and within the elevated temperature range of the tumor,

(c) activating the tumoricidal agent by heating the same within the tumor interstices above the melting point of the encapsulating resin so as to release the same within the tumor interstices without exposing the remaining normal body tissue to the effects of the agent.

5. A method for the administration of biologically active pharmaceuticals into a neoplasm of a mammal to reduce systemic side effects thereof which comprises:

(a) introducing intratumorally and extracellularly into the interstices of the neoplasm within the segment of the mammal to be treated a therapeutic dose of microcapsules of a biologically active pharmaceutical which has been precoated with a releasable polymeric encapsulating resin coating which has a melting point range extending from 40°–46° C. and which until the coating is removed is substantially inert biologically,

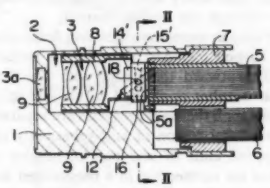
(b) removing this polymeric encapsulating resin coating from the pharmaceutical to release the active agent within the cellular interstices by radiofrequency heating the microcapsules above the melt temperature of the encapsulating resin.

4,558,691

ENDOSCOPE

Minoru Okada, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Japan

Filed Jul. 6, 1984, Ser. No. 628,254
Claims priority, application Japan, Aug. 18, 1983, 58-150501
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 16 Claims



1. An endoscope comprising:

an objective optical system disposed in the distal end portion of said endoscope and having a movable member which is movable in the direction of the optical axis thereof as a focus adjustment operation is made;

an image transmitter whose image receiving end plane is optically coupled to said objective optical system so as to transmit an image of an object being observed from said image receiving end plane to an image exit end plane of said image transmitter;

indicating index means disposed between said objective optical system and said image transmitter;

a transfer mechanism for allowing said indicating index means to move in a plane perpendicular to the optical axis of said objective optical system in cooperation with the movement of said movable member of said objective optical system;

an observation optical system for observing said image on said image exit end plane of said image transmitter; and

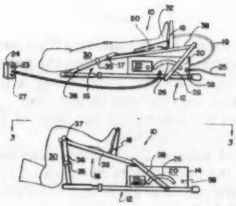
stationary reference index means disposed between said image transmitter and said observation optical system.

4,558,692

PASSIVE LEG EXERCISER

Donn B. Greiner, 506 Wellington Ave., Lincoln Park, Reading, Pa. 19609

Filed Jun. 25, 1984, Ser. No. 624,358
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R 14 Claims



1. In a motorized leg exerciser, said exerciser including an adjustable framework of rods, a movable jointed rectangular limb support operably connected to said rod's framework and a motor including a housing to activate periodic movement of said limb support, the improvement comprising:

(a) a footrest movably attached to said limb support so as to adjust to the user's leg length, said footrest including a foot pedal operably connected to an override switch;

(b) electrical override means operated by said override switch to stop said motor and reverse the direction of movement of said limb support;

(c) electrical means to stop said motor and reverse the direction of movement of said limb support,

(d) preferential electrical timing means to cause a pause of a predetermined length each time said override means or said electrical means is activated; and,

whereby, when a user places a leg on said limb support with the sole of his foot flat against said footrest, said exerciser will periodically, through said jointed limb support, move and thereby bend said user's leg a predetermined angular distance, said distance being determined by resistance pressure of the leg to bend, so that when said resistance pressure is exceeded, the user's foot presses said foot pedal against said override switch, activating said override switch, thereby stopping said motor through said preferential timing means for a timed pause and thereafter putting said motor in reverse to prevent leg injury or damage to the exerciser.

4,558,693

PENILE IMPLANT

Harvey Lash, 2309 Byron, and Morris Kibrick, 3921 Nelson Dr., both of Palo Alto, Calif. 94306

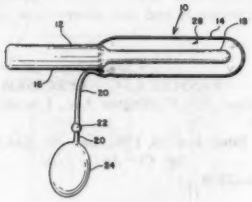
Filed Aug. 29, 1983, Ser. No. 527,703
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 11 Claims

1. A penile prosthesis comprising:

an elongated flexible rod, having a proximal portion and a distal portion, the distal portion having a greater length

and a smaller diameter than the proximal portion said distal and proximal portions meeting in a sloping shoulder;

an elongated, omni-directionally elastic balloon when in the quiescent state having an inner diameter that is at least as large as the diameter of distal portion of the rod, said balloon extending beyond the end of and surrounding the distal portion of the rod to form a cavity therebetween and having its open end sealed to said proximal portion at the shoulder;



a reservoir means for containing a fluid and for pressurizing a fluid within the cavity within the balloon;

fluid transfer means for transporting a fluid between the balloon and the reservoir means; and

valve means for controlling the flow of fluid between the balloon and the reservoir;

said rod and balloon combination disposed to be installed between the two corpora cavernosum extending from the pubis to the proximal glans with the distal portion oriented toward the glans.

4,558,694

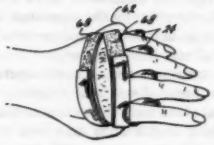
ULNAR DEVIATION SPLINT

Lois M. Barber, 728 Ocean Blvd., Pismo Beach, Calif. 93449

Filed Oct. 21, 1983, Ser. No. 544,284

Int. Cl.⁴ A61F *5/10*

U.S. Cl. 128—87 A **19 Claims**



1. An ulnar deviation splint comprising:

a bendable wire support frame engagable with at least a portion of the palm of a hand to be treated and a plurality of bendable wire finger separation members which are comprised of substantially flat rounded members;

fastening means for holding said splint against said palm; and,

cushioning material enclosing at least part of said splint.

4,558,695

METHOD OF MANUFACTURING A HEAT EXCHANGER

Takahiro Kumazawa, Anjo; Yoshihiro Nakamura, Tokoname, and Toshihisa Izawa, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

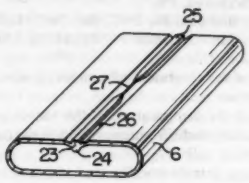
Filed Jun. 28, 1983, Ser. No. 508,532

Claims priority, application Japan, Jul. 2, 1982, 57-115669

Int. Cl.⁴ B23P *15/26;* **B22C** *13/10*

U.S. Cl. 228—183 **3 Claims**

1. A method of producing a heat exchanger comprising: a first step of bending a strip and welding the opposing edges of the thus bent strip to form a tube having a substantially circular cross-section; a second step of pressing and flattening said tube to form a flattened tube while depressing the wall of the tube slightly inwardly along the weld line; a third step of applying



a brazing material to the outer surface of said flattened tube; and a fourth step of assembling said flattened tube and a corrugated fin with each other and brazing the thus assembled flattened tube and said corrugated fin together.

4,558,696

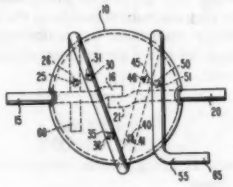
WATER TRAP

Gary K. Eiserman, Physics Bldg., University of Virginia, McCormick Rd., Charlottesville, Va. 22901, and Robert W. Hagar, 1503 Fulton Ave. #79, Sacramento, Calif. 95825

Filed Apr. 16, 1984, Ser. No. 600,242

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—205.12 **5 Claims**



1. A liquid water trap for continuous trapping of liquid from the gas passed by a pressurized breathing circuit of a ventilator, respirator, anaesthesia unit or the like, comprising:

a hollow, spherically shaped member having a plurality of holes through the surface thereof;

a pair of tubular members extending from within said spherically shaped member, through the surface thereof, and radially outward therefrom with the first end of each tubular member positioned within said spherically shaped member such that said first ends are separated and overlap in the central region of said spherically shaped member, the second ends of said pair of tubular members being adapted for connection in a pressurized breathing circuit for passage of the breathing circuit gas therethrough;

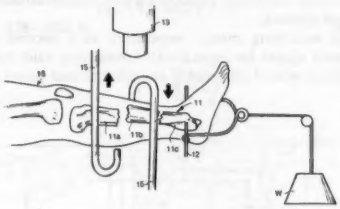
a drain tube member wrapped about the exterior of said spherically shaped member and having a smaller diameter than said pair of tubular members, with a plurality of holes on one side only of said drain tube member, the drain tube holes being substantially the same size as and overlying the spherically shaped member holes, so that liquid water lying in the lowest lying region within the spherically shaped member flows through the spherically shaped member holes and the drain tube holes and drains out said drain tube.

4,558,697

METHOD AND APPARATUS FOR SETTING FRACTURES

Kent K. Wu, Royal Oak, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,681
Int. Cl.⁴ A61B *17/00*; A61F *5/04*
U.S. Cl. 128—303 R **6 Claims**



1. In the method of setting fractures of a limb which comprises applying tension to the ends of the limb which is fractured while the limb is under X ray observation, manually manipulating the portions of the limb while it is under X ray observation to align the broken portions, and inserting a wire axially through the aligned portions, the improvement comprising

externally engaging a first portion of the limb adjacent the fracture with a first tool having a hook sufficiently larger to encircle the first portion,

externally engaging a second portion of the limb adjacent the fracture with a second tool having a hook sufficiently larger to encircle the second portion,

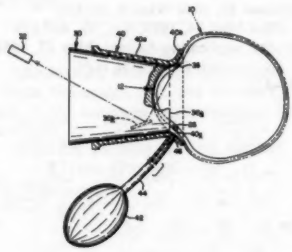
manipulating the portions of the limb by grasping the tools out of the range of the X ray exposure and moving the tools transversely to manipulate the portions of the limb to align the broken portions so that the wire can be inserted.

4,558,698

LASER CANALICULOSTOMY EYE-TREATMENT

Lawrence W. O'Dell, 34498 Deciwood Dr., Eugene, Oreg. 97401

Filed Mar. 1, 1984, Ser. No. 585,237
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—303.1 **6 Claims**



1. A method employing a laser for effecting the drainage of aqueous humor from the anterior chamber of an eye to the Canal of Schlemm, said method comprising

restricting the exit flow of blood from such Canal to cause the back-up collection therein of such blood, thus to shift the apparent color of the Canal toward the apparent color of such blood, and

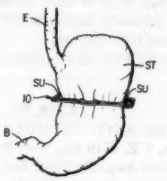
following said restricting, directing a beam from such a laser to create thereby a connective fluid passage extending generally between and communicating with an anterior chamber and the Canal.

4,558,699

METHOD OF AND APPARATUS FOR RESTRICTING THE PASSAGE OF FOOD THROUGH THE STOMACH

Samuel B. Bashour, 2504 Summit, Irving, Tex. 75062

Filed Jan. 3, 1983, Ser. No. 455,025
Int. Cl.⁴ A61B *17/08*
U.S. Cl. 128—346 **18 Claims**



1. An extended duration implantation apparatus for restricting the passage of food through a stomach comprising:

first and second cooperating jaws having opposed stomach wall engaging surface for clamping a stomach therebetween, the jaws being connected for co-planar pivotal movement with respect to each other;

said opposed stomach wall engaging surfaces of the jaws defining at least one relatively open area for permitting the passage of food through the portion of the stomach received therein and at least one relatively closed area for preventing the passage of food through the portion of the stomach received therein, the relatively closed area of the opposed stomach wall engaging surfaces of the jaws further characterized by a plurality of matingly engagable contours for gripping a portion of the stomach therebetween whereby said jaws are prevented from movement relative to the stomach;

means for preventing movement of the jaws relative to a stomach clamped therebetween;

the first jaw being of a one-piece construction and having and an integral latching member extending from the unhinged end thereof towards the second jaw, a portion of the latching member including a locking mechanism;

the second jaw having a receptacle for receiving the latching member of the first jaw and for engaging the locking mechanism of the latching member when the latching member is fully inserted therein; and

wherein the latching member, when fully inserted in the receptacle of the second jaw, maintains a predetermined distance of separation between the stomach engaging surfaces of the jaws throughout the relatively closed area defined thereby sufficient to substantially prevent traumatizing stomach tissue secured between the jaws.

4,558,700

UV RADIATION DEVICE FOR PHOTOTHERAPY OF DERMATOSES, ESPECIALLY PSORIASIS

Maximilian F. Mutzhas, Sonnenstr. 17, D-8000 Munchen 2, Fed. Rep. of Germany

PCT No. PCT/EP82/00273, § 371 Date Jul. 18, 1983, § 102(e) Date Jul. 18, 1983, PCT Pub. No. WO83/02233, PCT Pub. Date Jul. 7, 1983
PCT Filed Dec. 23, 1982, Ser. No. 518,798
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151494
Int. Cl.⁴ A61N *5/06*
U.S. Cl. 128—395 **12 Claims**

1. Radiation apparatus adapted for use in the phototherapy of dermatoses, including psoriasis, and capable of generating a

radiation dose between 0.7 and 1.0 times the erythema threshold dose, said apparatus comprising UV radiation means for producing UV radiation in a wavelength range from below 300 nm to 310 nm, the radiation between 300 nm and 310 nm having a radiation intensity E_1 in an effective radiation area and the radiation below 300 nm having a radiation intensity E_2 in said effective radiation area, said intensities having the following relationships in said area for the purpose of preventing the erythema threshold from preceeding the dermatose treatment threshold:

(a) the intensity E_2 is at most 0.35 E_1 if the radiation intensity below 295 nm is not greater than 0.01 E_1;

(b) the intensity E_2 is at most between 0.35 and 0.2 E_1 if the radiation intensity between 295 nm and 290 nm is not greater than 0.01 E_1; and

(c) the intensity E_2 is in all other cases at most 0.2 E_1.

4,558,701

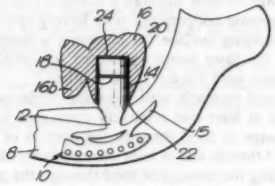
OSTEOBLASTIC STIMULATION IMPLANT

Robert Spalten, 9 E. 67th St., New York, N.Y. 10021

Filed Aug. 19, 1983, Ser. No. 524,822

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 F **2 Claims**



1. An electric osteoblastic stimulating implant for direct electric contact with the skeletal structure which consists of a current carrying base section having an integrally formed bone connecting extension, for rigid connection into the skeletal structure; and a current carrying head section movably mounted to the base section; a cup shaped chamber formed in one of the sections and opening between the sections, an integrally formed post extending from the other section, and forming a close sliding fit into the chamber, a pressure-responsive electriccurrent producing unit contained in the chamber, said head section operating the current producing unit to cause current to flow into the skeletal structure.

4,558,702

CARDIAC PACER HAVING INPUT/OUTPUT CIRCUIT PROGRAMMABLE FOR USE WITH UNIPOLAR AND BIPOLAR PACER LEADS

Francisco J. Barreras, Miami, Fla., and James P. Martucci, Palatine, Ill., assignors to Cordis Corporation, Miami, Fla.

Filed Jan. 21, 1983, Ser. No. 459,806

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **7 Claims**

1. In a cardiac pacer selectively operable in unipolar and bipolar pacing and sensing modes in response to an applied mode designation signal, an input/output circuit comprising:

a source of unidirectional current including a signal ground;

pacer lead terminal means including a cathode electrode and an anode electrode;

a differential sense amplifier operable from said current source, said amplifier having inverting and non-inverting input terminals and providing a sense signal in response to a non-common mode signal applied to said input terminals;

first coupling means for coupling one of said electrodes to one input terminal of said differential amplifier;

second coupling means for coupling the other of said electrodes to the remaining input terminal of said differential amplifier;

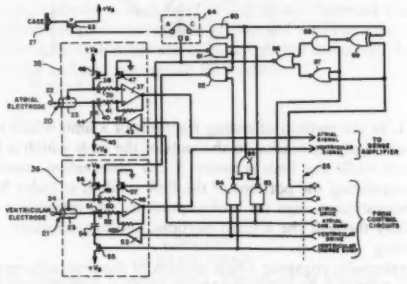
means including an output amplifier for generating a pacing pulse, said output amplifier having an output terminal;

third coupling means for coupling said other electrode to said output terminal;

reference terminal means including a reference electrode for establishing electrical contact with a patient's body;

first switching means responsive to a first applied control signal for electively connecting said one electrode to said signal ground;

second switching means responsive to a second applied control signal for selectively connecting said one input terminal of said differential amplifier to said signal ground;



third switching means responsive to a third applied control signal for selectively connecting said reference electrode to said signal ground; and

mode control means for generating said first, second and third mode control signals in response to the mode designation signal whereby said first and second switching means are open and said third switching means are closed for unipolar pacing, said first switching means are closed and said second and third switching means are open for bipolar pacing, said first switching means are open and said second and third switching means are closed for unipolar sensing, and said first and second switching means are open for bipolar sensing.

4,558,703

VESTIBULAR STIMULATION METHOD

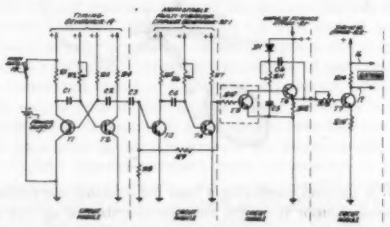
Hermann Mark, Fachartz fur Nals-Nasen-Ohrenhenheilkunde Favoritenstrasse 27, 1040 Wien 4, Austria

Filed May 24, 1983, Ser. No. 497,679

Claims priority, application Austria, May 27, 1982, 2095/82

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—421 **3 Claims**



1. A method for treating a patient afflicted with space sickness, air sickness, dizziness, sea sickness or the like comprising the steps of:

(a) applying electrodes to the patient;

(b) applying pulses of current through said electrodes to the patient to stimulate the patient's vestibular nerve, said pulses being in a frequency range of 1 to 5 pulses per

second, the pulses having a pulse width in the range of 100–300 msecs., the current being in the range of 0.5–3.8 mA.

4,558,704

HAND CONTROL SYSTEM

Jerrold S. Petrofsky, Beavercreek, Ohio, assignor to Wright State University, Dayton, Ohio

Filed Dec. 15, 1983, Ser. No. 561,720
Int. Cl.[4] A61N *1/08*
U.S. Cl. 128—423 R **26 Claims**

1. Hand control apparatus for a quadriplegic person comprising:

a control sensor for sensing movement of a non-paralyzed part of the body of said person and generating a corresponding hand control signal,

indicating means for indicating a reference value of said hand control signal,

microprocessor means connected to said control sensor and programmed for generating hand closing commands and hand opening commends in accordance with the value of said hand control signal relative to said reference value,

first stimulation means responsive to said hand closing commands for stimulating contraction of muscles connected for closing a hand of said person,

second stimulation means responsive to said hand opening signals for stimulating contraction of muscles connected for opening said hand, and

feedback means for sensing movement of said hand and transmitted a feedback signal to said microprocessor in correspondence thereto;

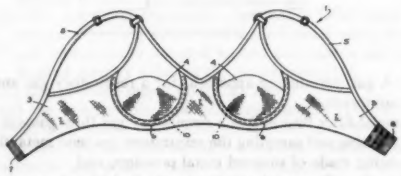
said microprocessor being further programmed for generating said hand closing commands in correspondence with the difference between said hand control signal and said feedback signal.

4,558,705

BRASSIERE SUPPORT ELEMENT

Dolores O'Boyle, Woodridge, N.J., and William C. Hittel, New Hyde Park, N.Y., assignors to International Playtex, Inc., Stamford, Conn.

Filed Jul. 25, 1984, Ser. No. 634,348
Int. Cl.[4] A41C *1/14*
U.S. Cl. 128—476 **27 Claims**



1. A plastic substantially U-shape support for use in conjunction with a cup of a brassiere, said support comprising:

a base portion located at the arc of the U-shape and having a first cross-sectional configuration;

a pair of intermediate portions each adjacent and connected to a different end of said base portion, each of said pair of intermediate portions having a second cross-sectional configuration different than said first cross-sectional configuration; and

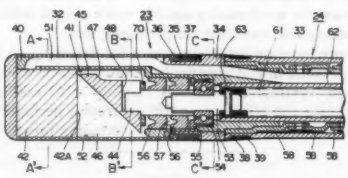
a pair of end portions each adjacent and connected to a different one of said pair of intermediate portions, each of said pair of end portions having a third cross-sectional configuration different than said first cross-sectional configuration and said second cross-sectional configuration.

4,558,706

DEVICE FOR DIAGNOSING BODY CAVITY INTERIORS WITH ULTRASONIC WAVES

Akio Nakada, Hachioji, and Kazumasa Matsuo, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,496
Claims priority, application Japan, Mar. 5, 1982, 57-34773
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **5 Claims**



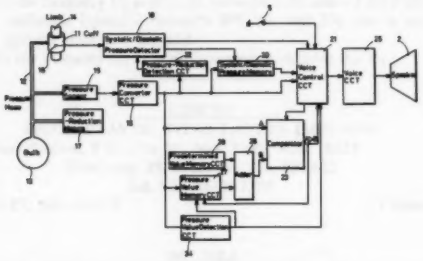
1. In a device for diagnosing body cavity interiors with ultrasonic waves said device having a probe, said probe comprising ultrasonic wave oscillator means adapted for transmitting and receiving ultrasonic waves and contained within a housing chamber fixed to a tip end of a tubular member for introduction into a body cavity and coated with a jacket cover, said jacket cover having an ultrasonic wave transmitting window therethrough, an ultrasonic wave transmitting medium filling said housing chamber, a rotated driven shaft in said housing chamber, means on said rotated driven shaft for reflecting waves transmitted by said ultrasonic wave oscillator and for receiving waves reflected thereto for conversion to electric signals, characterized in that said ultrasonic wave reflecting means includes a mirror at the front of said reflecting means and having a reflector surface for receiving and transmitting ultrasonic waves and recess means at the rear of said reflecting means for collecting and holding gas bubbles from said transmitting medium; that said tubular member has a flexible cover, said flexible cover and said jacket cover being fixed, respectively, to ring-shaped fixed members provided in a block between said tubular member and said housing chamber; and, that a communicating path is formed between the interior and the exterior of said housing chamber and is sealed adjacent the exterior of said housing chamber with a closing means within the outside diameter of said jacket cover without projecting there beyond, which closing means can be opened and closed.

4,558,707

ELECTRONIC SPHYGMOMANOMETER WITH VOICE SYNTHESIZER

Ryuichi Miyamae, Osaka, and Haruo Yasuda, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1983, Ser. No. 463,475
Claims priority, application Japan, Feb. 9, 1982, 57-17285[U]; Feb. 9, 1982, 57-17286[U]; Feb. 16, 1982, 57-20860[U]
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—683 9 Claims



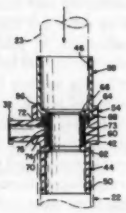
1. A sphygmomanometer comprising:
pressure generating means for developing a variable pressure for facilitating measurement of systolic and diastolic pressure;
pressure detection means for measuring systolic and diastolic pressure and providing an output indicative of said pressures;
voice synthesizer means responsive to the pressure detection means for synthesizing audible voice output indicative of said systolic and diastolic pressures; and
pressure increase detection means for detecting an increase in pressure in said pressure generating means, wherein said voice synthesizer means is responsive to said pressure increase detection means for generating periodic audible voice outputs indicative of the increasing pressure.

4,558,708

PATIENT'S AIRWAY ADAPTER TO WITHDRAW A PATIENT'S GAS SAMPLES FOR TESTING FREE OF SPUTUM MUCUS AND/OR CONDENSED WATER, BY UTILIZING A HOLLOW CYLINDRICAL HYDROPHOBIC LIQUID BAFFLE

Lawrence L. Labuda, Issaquah, and Daniel W. Knodle, Seattle, both of Wash., assignors to Tri-Med, Inc., Redmond, Wash.

Filed Oct. 24, 1984, Ser. No. 664,152
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—719 19 Claims



1. A patient's airway adapter to withdraw a patient's gas samples from a patient's airway for testing in a respiratory monitor, free of sputum, mucus, and/or condensed water, comprising:

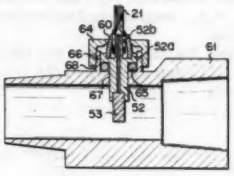
(a) a housing having:
an interior to continue the patient's airway passageways extending between a patient and respiratory sustaining equipment;
a centered flow through interior receiving chamber within the interior of the housing to receive a hydrophobic membrane type liquid blocking but gas passing baffle;
a passageway extending essentially radially outwardly through the housing from the centered flow through interior receiving chamber;
a connector portion on this passageway extending through the housing, to receive a patient's gas sampling cannula;
respective connector portions on the housing adapted to interfit with endotracheal or tracheal tubes or other airway components extending to a patient;
respective connector portions on the housing adapted to interfit with tubes or other airway components extending to respiratory sustaining equipment; and
(b) a hollow cylindrical hydrophobic membrane type baffle received in the centered flow through interior receiving chamber within the interior of the housing: to continue the interior of the patient's airway passageway; to block the radial passage of sputum, mucus, and/or water; and to allow the radial passage of the patient's gas through this hollow cylindrical hydrophobic membrane type baffle, through the radial passageway of the housing and beyond through a patient's gas sampling cannula to a respiratory monitor.

4,558,709

GAS INTRODUCING APPARATUS FOR RESPIRATORY GAS ANALYZER

Satoshi Aida, and Ayao Itoh, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 25, 1983, Ser. No. 545,155
Claims priority, application Japan, Oct. 30, 1982, 57-191443; Nov. 2, 1982, 57-191912
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—719 8 Claims



1. A gas introducing apparatus for a respiratory gas analyzer, comprising:
a metal filter disposed in a respiratory gas flow passage for filtering and sampling the respiratory gas, said metal filter being made of sintered metal powders; and
a gas introducing tube, a distal end of which is hermetically connected with said metal filter, for guiding a sampled gas to said gas analyzer.

4,558,710

TESTING OF THE AIRWAYS AND PULMONARY TRACT OF A PATIENT, PARTICULARLY FOR SENSITIVITY TO AEROSOLS

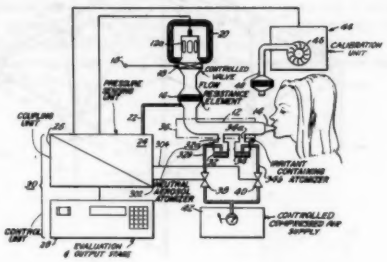
Riidiger Eichler, Zellingen, Fed. Rep. of Germany, assignor to Erich Jaeger GmbH & Co., Hoechberg, Fed. Rep. of Germany

Continuation of Ser. No. 274,527, Jun. 17, 1981, abandoned. This application May 16, 1984, Ser. No. 611,372

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023648

Int. Cl.⁴ A61B *5/08*

U.S. Cl. 128—720 **20 Claims**



1. Diagnostic apparatus for testing the airways and pulmonary tract of a patient for sensitivity to specific substances administered in a first aerosol, said apparatus comprising

a mouthpiece (**14**) adapted for breathing connection with the mouth of the patient;

a single breathing tube duct means (**12**) having a first end coupled to said mouthpiece, and a second end communicating with a breathable gas;

first atomizing means (**34**) for producing said first aerosol and having an operating energy inlet and a first aerosol outlet (**34**);

second atomizing means (**32**) for producing a second aerosol differing from said first aerosol, and having an operating energy inlet and a second aerosol outlet (**32**);

atomizing energy control means (**38, 40, 42**) coupled to both the atomizing means for selectively controlling application of atomizing energy from an energy input to said atomizing means;

means for producing a signal corresponding to the gas flow in said breathing tube duct means and comprising

airways resistance determination means including controllable flow resistance means (**16, 18**) in said duct means, and pressure sensor means (**24**) having an inlet (**22**) coupled to said duct means; and

control means (**30**) coupled to the atomizing energy application control means and the airways resistance determination means;

wherein said breathing duct means has, in operation, continuously connected thereto in the order named from said first to said second ends:

(a) the first continuously open outlet (**34*a***) from said first atomizing means, said first outlet being directly and continuously coupled to said duct means and being located directly adjacent the mouthpiece (**14**),

(b) the second continuously open outlet (**34*a***) from said second atomizing means, said second outlet being directly and continuously coupled to said duct means and being located directly adjacent the mouthpiece (**14**),

(c) said pressure sensor inlet (**22**), and

(d) the controllable flow resistance means (**16, 18**); said pressure sensor means (**24**) being coupled to said control means (**30**) for determination of airway resistance; and

wherein said control means (**30**) is responsive to inhaling (IN) and exhaling (EX) breathing phases of the breathing cycle of the patient, and controls the supply of atomizing energy to the operating energy inlet of both said atomizing means to cause, selectively, introduction of the first aerosol into the breathing tube duct means during a portion only of the inhaling phase (IN) of at least one breathing cycle and selectively permit introduction of another aerosol during another breathing cycle while preventing contamination of the breathable gas by said first aerosol of the other aerosol,

said atomizing energy causing atomization of the respective aerosol, and termination of supply of atomizing energy terminating vaporization of the selected aerosol.

4,558,711

COIN PROCESSING APPARATUS

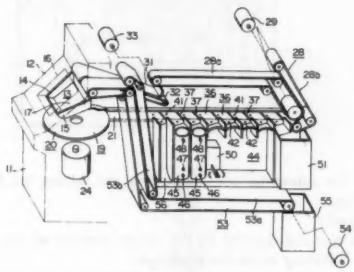
Ikuta Yoshiaki, and Takashi Tanaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jul. 2, 1984, Ser. No. 626,827

Claims priority, application Japan, Jul. 8, 1983, 58-125326; Aug. 4, 1983, 58-142727

Int. Cl.⁴ G07D *3/00*

U.S. Cl. 133—3 F **8 Claims**



1. A coin processing apparatus comprising:

coin receiving means for receiving coins in a lump;

conveyor means including a conveyor path, receiving the coins from the coin receiving means and conveying the coins successively;

identifying means for identifying each coin as to denomination as the coin is conveyed by the conveyor means;

temporary retainer means receiving the coins from the conveyor means and transferring the coins to the coin receiving means;

separating devices provided to separate, when actuated, the coin from the conveyor path;

container devices associated with the respective separating devices to receive and contain the coins separated by the associated separating device; and

control means causing, when coins are inserted in the coin receiving means, the coin receiving means and the conveyor means to be actuated such that the coins be transferred from the coin receiving means, through the conveyor means to the temporary retainer means and causing the identifying means to identify the coins successively conveyed by the conveyor means, and to produce data concerning the coins identified,

said control means causing, after all the coins inserted have been transferred out of the coin receiving means, the temporary retainer means to be actuated such that the coins be transferred from the temporary retainer means to the coin receiving means,

the control means being responsive to an accept command inputted by an operator for actuating the coin receiving means and the conveyor means such that the coins having been transferred from the temporary retainer means to the coin receiving means be transferred to the conveyor means, and causing the identifying means to identify the coins as to denomination, and causing the separating de-

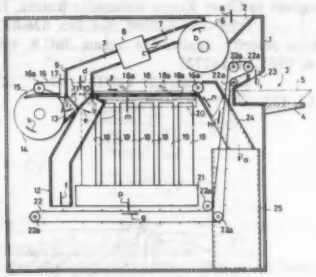
vices to selectively separate the coins in accordance with the result of the identification.

4,558,712

AUTOMATIC COIN DEPOSITING AND PAYING MACHINE

Hideshi Sentoku, Tokyo, and Yoshiaki Uematsu, Hiratsuka, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,588
Claims priority, application Japan, Jul. 8, 1982, 57-118990
Int. Cl.[4] G07D *1/02, 3/14*
U.S. Cl. 133—3 R 6 Claims



1. An automatic coin depositing and paying machine comprising:

a body,

an opening located at the upper portion of the body for receiving coins therethrough,

first coin transfer means communicating at one end with said opening for inclinedly and downwardly transferring coins from said opening one by one,

first discriminator means located within said first coin transfer means for discriminating acceptable and unacceptable coins and for generating a first signal representative of one of acceptable and unacceptable coins,

temporary storage means located at the other end of said first coin transfer means for temporarily storing coins having passed through said first coin transfer means,

conveying means communicating with said temporary storage means for selectively receiving coins from said temporary storage means in response to said first signal,

horizontal transfer means having one end located adjacent said conveying means for receiving coins from said conveying means and for conveying the coins horizontally,

second discriminator means located within said horizontal transfer means for discriminating the denomination of coins and for generating a second signal representative of the denomination of a coin,

a plurality of coin storing means located downstream of and below said horizontal transfer means for receiving coins therein in accordance with the denomination of each coin in response to said second signal,

pay-off means located at the bottom of each said plurality of coin storing means for paying out coins one by one from the bottom of each of said plurality of coin storing means,

second coin transfer means communicating with said temporary storage means for selectively receiving coins in response to said first signal and guiding coins downwardly,

an exit defined by the body and located adjacent said opening for discharging coins therethrough, and

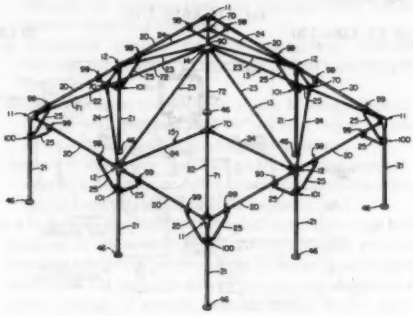
lift means having a first portion located below said plurality of coin storing means and said second transfer means for receiving coins therefrom and a second portion for conveying received coins to said exit.

4,558,713

FRAME SYSTEM AND CONNECTORS FOR PORTABLE SHELTERS

Ernest Hagler, Denver; Charles A. Roose, Aurora, and John B. Claypool, Denver, all of Colo., assignors to American Canvas Company, Denver, Colo.

Filed Oct. 29, 1982, Ser. No. 437,878
Int. Cl.[4] A45F *1/16*
U.S. Cl. 135—106 15 Claims



1. In a frame assembly for a portable shelter wherein said frame assembly is provided with a vertical leg at spaced intervals, eave poles extending horizontally between upper ends of adjacent vertical legs, and rafter poles inclining upwardly from upper ends of said vertical legs for releasable interconnection to one another at a commom center, the improvement comprising:

a unitary four-way connector unit including a vertical leg-connecting socket member, a pair of horizontal eave pole-connecting socket members extending in substantially perpendicular relation to said leg-connecting socket member, and a rafter pole connector extending between said horizontal socket members;

first releasable coupling means between each of said socket members and adjoining ends of said vertical leg and eave pole members whereby to facilitate releasable connection therebetween without the use of tools, and second releasable coupling means between an end of each said rafter pole and each said rafter pole connector for angularly adjustable attachment of said rafter pole to said connector, said second releasable coupling means including opposed bayonet slots at said one end of said rafter pole, an anchor bar on said rafter pole connector insertable into said bayonet slots, and closure means normally retaining said anchor bar in closed ends of said slots; and

a crown connector interconnecting upper ends of said rafter poles comprising a plurality of anchor bars joined in end-to-end relation to one another, longitudinally extending bayonet slots in each upper end of said rafter poles and spring-loaded closure means urged in a direction retaining one of said anchor bars in each of said slots.

4,558,714

RESIN INTERFACE DETECTION SYSTEM

Frank J. Frigiola, Northvale, N.J., assignor to Ecodyne Corporation, Union, N.J.

Filed May 12, 1983, Ser. No. 493,827
Int. Cl.[4] F17D *3/00, 3/01*
U.S. Cl. 137—2 17 Claims

1. A method of detecting the interface between classified layers of a mixed resin bed in a slurry passing from an area near the bottom of a container having cation and anion exchange resins classified substantially so that cation exchange resin forms the bottom layer, inert material forms an intermediate

layer and anion exchange resin forms the top layer, comprising the steps of:

(a) measuring the conductivity of said passing slurry;

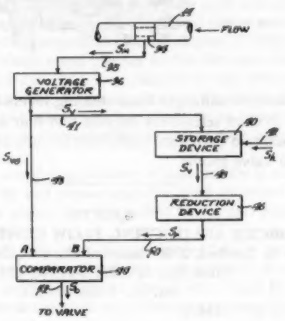
(b) generating a measuring signal representing the conductance value of said passing slurry;

(c) generating an initial voltage signal representing the conductance value of said passing slurry responsive to the measuring signal representing an initial conductance value of said passing slurry;

(d) storing said initial voltage signal representing the initial conductance value of said passing slurry in a means for storing electrical signals;

(e) generating a reduced voltage signal representing at most 30 percent of the initial voltage signal representing the initial conductance value of said passing slurry;

(f) measuring subsequent values of the conductivity of said passing slurry;



(g) generating subsequent measuring signals representing subsequent conductance values of said passing slurry;

(h) generating a voltage signal representing each of said subsequent conductance values of said passing slurry responsive to each of said subsequent measuring signals;

(i) comparing each of the subsequent voltage signals with the reduced voltage signal proportional to said stored voltage signal representing the initial conductance value in a means for comparing voltage signals;

(j) generating an output from said comparing means when one of the subsequent voltage signals is equal to the reduced voltage signal; and

(k) terminating the flow of said passing slurry automatically in response to the output generated by said comparing means.

4,558,715

APPARATUS FOR INJECTING MEASURED QUANTITIES OF LIQUID INTO A FLUID STREAM

Frank A. Walton, Dallas, Tex., and Paul M. Perrinet, Merignac, France, assignors to Kowatachi International, Ltd., London, England

Filed May 16, 1984, Ser. No. 610,755
Int. Cl.⁴ G05D *11/03*
U.S. Cl. 137—99 **19 Claims**

1. Apparatus for injecting a predetermined quantity of fluid additive into a primary fluid stream comprising:

a housing defining first and second cylinder bores of different diameters, a differential piston assembly reciprocably disposed in said bores and forming first, second and third fluid chambers in said housing;

an inlet passage in said housing for conducting primary fluid under pressure to said first chamber to act on said piston assembly;

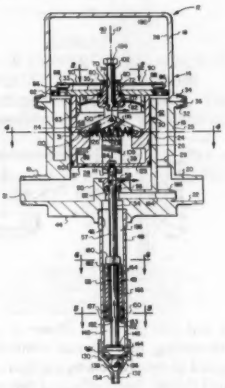
a discharge passage in said housing for conducting primary fluid from said second and third chambers from said apparatus;

additive fluid cylinder means and additive fluid piston means reciprocably disposed in said additive fluid cylinder means for displacing a quantity of additive fluid from said additive fluid cylinder means for injection into said primary fluid;

piston rod means interconnecting said piston assembly with said additive fluid piston means for reciprocation with said piston assembly;

first and second valves associated with said piston assembly and movable to respective positions to place said first and second chambers in communication with each other and close off communication between said second and third chambers and alternately close off said first chamber from said second chamber while communiating said second chamber with said third chamber;

a shaft disposed on said piston assembly for moving said valves between said positions;



first toggle means for urging said shaft into respective ones of said positions in response to movement of said shaft for biasing said valves in said positions, respectively; and

second toggle means connected to said first valve for urging said first valve in open and closed positions, respectively;

said piston assembly, said additive fluid piston means and said shaft being arranged generally coaxial with a central axis of said piston rod means for causing forces acting on said piston assembly to reciprocate said additive fluid piston means to be directed substantially along said axis, and said shaft including means coaxial with a central axis of said piston rod means at opposite ends of said shaft engageable with said housing to initiate movement of said shaft in opposite directions in response to movement of said shaft with said piston assembly toward opposed limit positions of said piston assembly.

4,558,716

VALVE BODY FOR MULTIPLE VALVE INSERT PACKAGES

John D. Muchow, Long Beach, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Apr. 22, 1983, Ser. No. 487,457
Int. Cl.⁴ F16K *39/00*
U.S. Cl. 137—269 **9 Claims**

1. In valve apparatus adapted to use with different flow control packages each of which includes first and second flow control units for controlling different flow conditions, the combination comprising

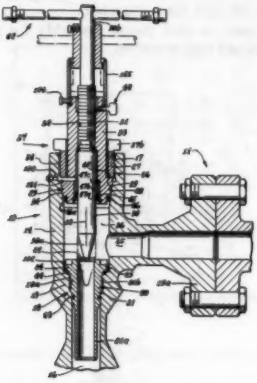
(a) an axially elongated and tubular valve body having a side fluid inlet port, a fluid outlet port at one end of the body, and control entrance at the opposite end of the body,

(b) first attachment structure including first internal threading on the body at a first tubular interior region generally

between said ports, said first attachment structure adapted to threadably receive a first flow control unit of a selected flow control package inserted into said body via said entrance,

(c) and second attachment structure including second threading on the body at a second tubular region generally between said entrance and said ports, said second attachment structure adapted to receive a second flow control unit of said selected package inserted into said body via said entrance, for retention by said second threading,

(d) said second attachment structure also including an internal conical thread free surface on the body between said



entrance and said ports but closer to said ports than said second threading, said internal conical threed a free surface adapted to receive clamping thereagainst of an external conical thread free surface of the second flow control unit, said first and second internal threading and said internal conical surface having a common central axis, said first internal threading being closer to said axis than each of said second internal threading and said conical surface,

(e) whereby said first and second flow control units are then positioned to control flow passing from said fluid inlet port to the fluid outlet port.

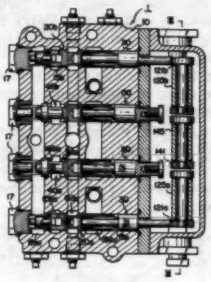
4,558,717

STEERING CONTROL VALVE SYSTEM FOR CRAWLER VEHICLE

Hiroshi Ueda; Takeshi Matsumoto, and Masami Hashimoto, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 582,216
Claims priority, application Japan, Feb. 21, 1983, 58-026334
Int. Cl.[4] F15B *13/06*
U.S. Cl. 137—596 **4 Claims**

1. A steering control valve system for a crawler vehicle: comprising one valve body; four valve bores formed in said valve body in parallel at substantially equal intervals so as to constitute clutch valves and brake valves on both left and right sides of the vehicle, said four valve bores being a left-hand clutch valve dedicated bore formed on one side of the valve body, a right-hand clutch valve dedicated bore formed on the other side of the valve body, a left-hand brake valve dedicated bore formed in a position close to the center of the valve body and also close to said left-hand clutch valve dedicated bore, and a right-hand brake valve dedicated bore formed close to the center of the valve body and also close to said right-hand clutch valve dedicated bore; four valve spools respectively inserted slidably into said four valve bores, said four valve spools being a left-hand clutch valve spool, a right-hand clutch valve spool, a left-hand brake valve spool and a right-hand brake valve spool; and four actuator members respectively inserted slidably into said valve bores so as to operate said four valve spools; and further comprising a link mechanism for operatively connecting between said four actuator members



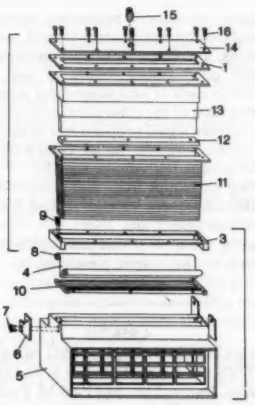
and two left- and right-hand steering levers as well as a brake pedal so as to selectively operate said four actuator members, in which said valves are controlled by only a push-in operation of said valve spools.

4,558,718

FORCED AIR DUCTING FLOW CONTROL VALVE

James R. Garfield, 2700 Balmoral Ct., Fort Collins, Colo. 80525

Filed Jun. 3, 1983, Ser. No. 431,726
Int. Cl.[4] F16K *31/126*
U.S. Cl. 137—614.11 **14 Claims**



1. A forced air ducting flow control valve comprising:

an outer case of sufficient inner dimension to house components of said flow control valve, where two opposite sides of said outer case, are air permeable and form an air passageway through said outer case perpendicular to said air permeable sides, where one remaining side parallel to said air passageway, is open, where all other sides of said outer case are air impermeable and closed;

and a blanket of flexible material comprising four edges and a middle, those edges corresponding to an edge of said open side of said outer case which is perpendicular to said air passageway are attached to spring loaded cylinders in a scroll-like fashion and roll upon the cylinders, where said cylinders are attached by their respective ends opposite each other on said open side of said outer case so as to be perpen-

dicular to said air passageway, where said cylinders are free to roll said blanket upon them when attached to said outer case, where spring loading in said cylinders supplies enough pressure to roll said blanket upon said cylinders and pull said valve to an open position when said valve is opening;

and a rubber bladder having an inner and outer dimension, where said outer dimension is approximately equal to the inner dimension of said outer case, where one side of said bladder is open, that side corresponding to said open side of said outer case, where all other sides of said bladder are closed and air impermeable, where said bladder fits inside said outer case with said blanket fitting between said bladder and said outer case;

and a telescoping piston assembly comprising at least two pistons, each having an outer dimension, where the outer dimension of the first piston is less than the inner dimension of said bladder, where the extended length of said piston assembly is equal to the distance from said open side of said outer case to the side opposite it, where said piston assembly powers, by way of compressed gas, the closing of said valve by pulling said bladder and blanket across the inner dimension of said outer case in a way parallel to said permeable sides of said outer case, where air escaping from said piston assembly fills said bladder which expands, to be constrained by said outer case to form an efficient obstruction in said air passageway;

and a piston bar where full movement of said bladder is assured when powered by said piston assembly to an extended position, where said piston bar is attached to the last piston in said piston assembly;

and a bladder guide piston bar clamp which attaches the middle of said blanket to that closed side opposite said open side of said bladder and attaches said closed side of said bladder to said piston bar so that said piston bar is inside said bladder which is within said blanket;

and a cover plate where a surface of dimension is at least equal to the dimension of the open end of said bladder, where a compressed gas connection allows an air passageway through said surface;

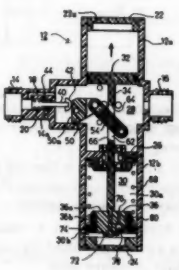
and a manifold assembly, where said bladder and said piston assembly are free to travel through said manifold, where said cover plate, said piston assembly, and said bladder are attached to said manifold to form an airtight chamber, where said airtight chamber is attached by way of said manifold to said open side of said outer case, where said blanket is free to travel between said manifold and said outer case.

4,558,719

CYCLICALLY-OPERABLE VALVE PARTICULARLY FOR IRRIGATION

Isaac Rinkewich, 12 Fishman Maimon St., Tel-Aviv, Israel

Filed Mar. 29, 1984, Ser. No. 594,875
Claims priority, application Israel, Nov. 25, 1983, 70328
Int. Cl.[4] F16K *31/48*
U.S. Cl. 137—624.14 **7 Claims**



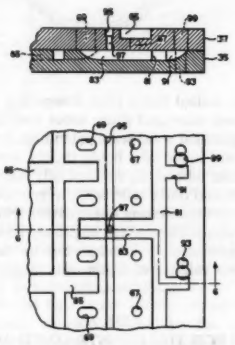
1. A cyclically-operable valve including an inlet connectable to a pressurized fluid supply line, an outlet, a valve member controlling the flow of the fluid form the inlet to the outlet, and a cyclically-operable timer driven by the energy of the pressurized fluid and coupled to said valve member for cyclically opening and closing same; said cyclically-operable timer comprising: a reciprocatable piston fixed to one end of a stem and driven by the pressurized fluid through forward strokes; return means for driving, said piston and stem through return strokes; a fluid dashpot device fixed to the opposite end of said stem and retarding its movement; and coupling means coupling an intermediate portion of said stem to said valve member for cyclically opening and closing same; said dashpot device being effective: (a) during the portion of each cycle when the valve member is open, to permit the pressurized fluid to drive the piston through a fast forward stroke to close the valve, and (b) during the portion of each cycle when the valve member is closed, to permit said return means to drive the piston through a slow return stroke to open the valve.

4,558,720

CLOSED-CENTER CONTROLLER FOR USE WITH UNEQUAL AREA CYLINDER

Bernard J. Larson, New Hope, and James K. Yip, Richfield, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 476,078, Mar. 17, 1983, abandoned.
This application Jun. 27, 1985, Ser. No. 749,130
Int. Cl.[4] B62D *5/08*
U.S. Cl. 137—625.24 **7 Claims**



1. In a closed-center, non load-sensing controller for use with an unequal area piston-cylinder fluid pressure device, the controller being of the type including a housing having a fluid inlet port, a fluid return port, and a pair of control fluid ports adapted for connection to the fluid pressure device; valve means disposed within said housing including a primary rotatable valve member and a relatively rotatable follow-up valve member defining a neutral position and at least one operating position, a fluid meter associated with said housing and including a movable member operable to measure the volume of fluid passing through said fluid meter, said follow-up valve member and said housing cooperating to define a plurality of meter passages operable to communicate fluid between said valve means and said fluid meter when said valve means is in said operating position, said follow-up valve member and said housing cooperating to define a plurality of control passages operable to communicate fluid between said valve means and said control fluid ports, said meter passages and said control passages defining a control fluid region, said follow-up valve member and said housing cooperating to define an inlet fluid region in fluid communication with said fluid inlet port, characterized by:

(a) said follow-up valve member and said housing cooperating to define a generally annular leakage fluid chamber

disposed axially between said inlet fluid region and said control fluid region to interrupt the flow of leakage fluid from said inlet fluid region to said control fluid region between said housing and said follow-up valve member; and

(b) neutral drain passage means disposed to provide fluid communication between said leakage fluid chamber and said fluid return port when said valve means is in said neutral position, flow through said neutral drain passage means being blocked when said valve means is in said operating position.

4,558,721

DOUBLE WALLED TUBING

Gerald R. Trudell; Theodore F. Kraska, both of Pinconning, and Dennis W. Barber, Kawkawlin, all of Mich., assignors to APX Group Inc., Toledo, Ohio

Division of Ser. No. 425,891, Sep. 28, 1982, Pat. No. 4,483,061. This application Jul. 3, 1984, Ser. No. 627,870

Int. Cl.[4] D03D *49/26*

U.S. Cl. 138—151 4 Claims

1. A double walled metal tube comprising inner and outer metal tubes, said inner and outer tubes each being characterized by a longitudinal weld seam extending along their respective lengths, said inner tube being tightly interterence nested within said outer tube along substantially the entire lengths of said tubes with said outer tube being in an expanded condition and tight interterence nesting engagement with said inner tube such that the seams thereof are angularly separated from one another by approximately ¼ inch, whereby the double walled tube can be bent relative to a generally single seam location.

4,558,722

APPARATUS FOR THE CONSTRAINED ACTUATION OF THE CLAMPING SYSTEM OF FILLING YARN INSERTING MEMBERS IN SHUTTLELESS WEAVING MACHINES

Fritz Gehring, Lindau-Bodolz; Stephan Arndt, Sigmarszell, and Harald Störr, Lindau, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

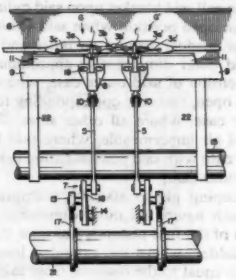
Filed Mar. 20, 1984, Ser. No. 591,412

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320200

Int. Cl.[4] D03D *47/18*

U.S. Cl. 139—446 3 Claims

1. In an apparatus for controlling the opening and closing of a thread gripper device in a shuttleless weaving machine including a reed stay mounted to a batten shaft, wherein a control member for said gripper device is driven by cam and cam follower means including a rocker lever carrying a cam follower, the improvement wherein said control member comprises a rigid control end for cooperation with the respective gripper device and a guide rod end for guiding said control member in its movement, straight guide means mounted to said reed stay, said guide rod end extending slidably through said straight guide means, a coupling link, first pivot means pivotally connecting one end of said coupling link to said rocker lever for transmitting a rocker movement to said coupling link, and second pivot means pivotally connecting said coupling link to said guide rod end for operating said rigid control end of said control member, whereby said second pivot means also



permit a hinging motion between said coupling link and said guide rod end of said control member.

4,558,723

SENSOR FOR CONTROLLING THE SUPPLY OF WEFT YARN OR THE LIKE

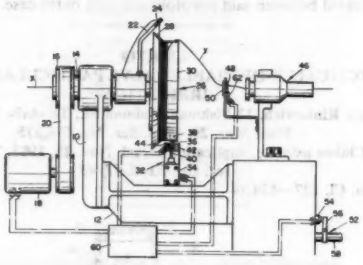
Shigenori Tanaka, Hachioji, and Kouji Tomita, Tama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Dec. 12, 1983, Ser. No. 560,376

Claims priority, application Japan, Dec. 13, 1982, 57-217054

Int. Cl.[4] D03D *47/34, 51/34*

U.S. Cl. 139—452 11 Claims



1. A sensor arrangement for sensing the amount of thread being supplied from a source thereof to an apparatus which uses same, comprising;

a guide in which an aperture is formed and through which said thread passes from said source to said apparatus;

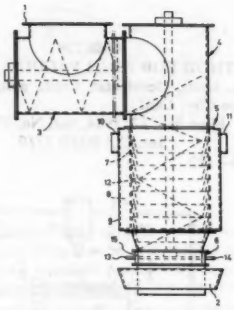
means for inducing a spiralling motion in said thread prior to entering said aperture and in a manner such that said thread slides in a predetermined direction around an inner periphery of said aperture; and

a sensor which detects said thread passing by a preselected point on said inner periphery and which outputs a signal each time said thread passes by said point.

4,558,724
APPARATUS FOR TRANSFERRING PULVERULENT MATERIAL

Sune J. R. Carlsson, Tallåsvägen 8, 311 01 Falkenberg, Sweden

PCT No. PCT/SE82/00176, § 371 Date Jan. 17, 1983, § 102(e) Date Jan. 17, 1983, PCT Pub. No. WO82/04034, PCT Pub. Date Nov. 25, 1982
Continuation of Ser. No. 459,545, Jan. 17, 1983, abandoned. This PCT application May 17, 1982, Ser. No. 651,640
Claims priority, application Sweden, May 21, 1981, 8103221
Int. Cl.⁴ B65B 1/04
U.S. Cl. 141—286 12 Claims



1. An apparatus for transferring a pulverulent material from a store to a destination site, said apparatus comprising

a screw conveyor means for transporting said pulverulent material, said screw conveyor having an inlet and an outlet for said material;

a filter means for allowing the passage essentially only of air therethrough, said filter surrounding said conveyor at least at the outlet of said conveyor;

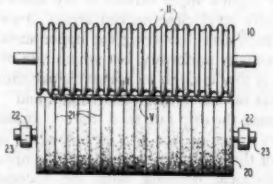
damper means disposed at the outlet of said conveyor means for controlling flow of material from said outlet, wherein said damper means is operative to be opened by the material transported by the screw conveyor;

wherein said filter means comprises a filter sheet in the form of a circular drum having an inner side and a multiplicity of frusto-conical rings, said rings disposed on the inner side of said drum and directed with their ends of smaller diameter in a direction towards said damper means.

4,558,725
LONGITUDINAL TENDERIZING OF VENEER

Lee E. Veneziale, Tyrone, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,620
Int. Cl.⁴ B27M 1/02
U.S. Cl. 144—362 14 Claims



1. A method of tenderizing a sheet of wood veneer comprising the steps of:

a. drawing a sheet of veneer along a longitudinal direction parallel with the grain of said sheet into a first nip between an elastomer surface backing roll and a corrugated roll having corrugation flutes extending predominately around the surface of said corrugated roll to distress longitudinally extending first strip areas of said sheet on the side thereof adjacent said backing roll and opposite of sheet contact areas by flute crests;

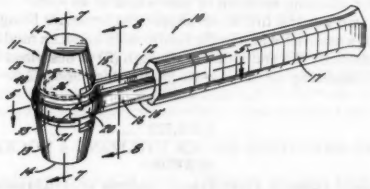
b. drawing said sheet along said longitudinal direction into a second nip between an elastomer surface backing roll and a corrugated roll whereby contact points of flute crests corresponding to said second nip corrugated roll distress second strip areas parallel with but laterally offset from said first strip areas; and,

c. drawing said sheet along said longitudinal direction into additional nips between an elastomer surface backing roll and a corrugated roll to distress additional, laterally offset and parallel strip areas until substantially the entire surface of said sheet has been distressed.

4,558,726
HAMMER WITH REPLACEABLE HEAD

Howard W. Clay, c/o Endall Company, 5083 27th Ave., Rockford, Ill. 61109

Continuation-in-part of Ser. No. 257,729, Apr. 27, 1981, abandoned. This application May 30, 1984, Ser. No. 615,154
Int. Cl.⁴ B25D 1/00
U.S. Cl. 81—25 9 Claims



1. A hammer having a handle and a head, a hole extending through said head, an elongated threaded projection joined rigidly to and extending from said handle and telescoped into the hole in said head, a strap joined rigidly to one end portion of said handle and defining a cradle for said head, said strap straddling said projection, key means on the ends of said strap, complementary key means joined rigidly to said head and interfitting with the key means on said strap to prevent said head from turning relative to said handle, and a threaded fastener releasably securing said head against separation from said handle, said threaded fastener being threadably connected to said projection and clamping against said head, said strap and said projection being joined rigidly to said handle independently of said threaded fastener, and said complementary key means being joined rigidly to said head independently of said threaded fastener.

4,558,727
INTEGRAL TIRE WHEEL

John H. Golata, Lansing; David M. Saylor, Holt, both of Mich.; William E. Egan, Tallmadge, and Arthur A. Goldstein, Mayfield Village, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 3, 1984, Ser. No. 637,359
Int. Cl.⁴ B60B 9/00
U.S. Cl. 152—5 12 Claims

1. An integral tire wheel supporting structure comprising:

(a) an annular support member having a generally C-shaped cross-sectional shape, the radially outer portion of said annular support member forming an approach angle in the range of 0° to 20°, the radially outer end of said annular support member having a flared out portion disposed at an angle greater than said approach angle, a ground engaging tread portion disposed on the radially outer surface of said annular support;

(b) an annular stress decoupling member disposed at the radially inner end of said annular support member and having a substantially C-shaped cross-sectional shape which is substantially less in size than said annular support member, the open end of said C-shaped structure of said annular stress decoupling member is directed in the same general direction as the C-shaped cross-sectional shape of said annular support member;

(c) the radially inner end of said stress decoupling member merges into an annular mounting member having means for allowing securing of said wheel to an axle;

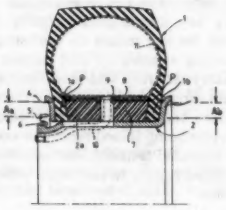
(d) said integral tire wheel supporting structure being made of a material wherein the relationship between modulus of elasticity (E) and ultimate strength (S) as described by the relationship ($E/S^{3/2}$) is no greater than about 2.6.

4,558,728

TIRE MOUNTING DEVICE UTILIZING A LOCKING SLEEVE

Alexandre Forneris, Paris, France, assignor to Hutchinson S.A., Paris, France

Filed Jan. 11, 1983, Ser. No. 457,225
Claims priority, application France, Jan. 15, 1982, 82 00607
Int. Cl.[4] B60C *15/02*
U.S. Cl. 152—400 **16 Claims**



1. A device for mounting a tire on a dismountable rim having a bottom portion and first and second opposed flanges in contact along first and second areas of contact with first and second beads of the tire, respectively, the device in an inflated state comprising:

deformable, substantially voidless, circumferentially continuous and incompressible sleeve means encircling the rim for being deformed between said first and second beads and for holding said first and second beads of said tire against said first and second flanges, said sleeve means having an opening formed therein for permitting passage of air therethrough; and

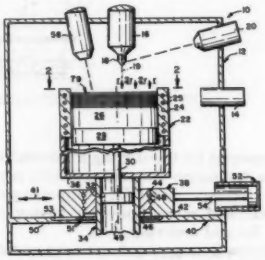
means positioned in said sleeve means for causing locking engagement of said sleeve means on said bottom portion of said rim, for preserving a constant external diameter of said sleeve means and for securing said first and second beads of said tire between said sleeve means and said first and second flanges, respectively, wherein said means for causing locking engagement of said sleeve means further comprises a circumferentially continuous reinforcement layer positioned in said sleeve means at a radial position which is located radially outward of said area of contact of said first and second opposed flanges with said first and second beads of said tire.

4,558,729

METHOD FOR HIGH VACUUM CASTING

Charles d'A. Hunt, Occidental, Calif., assignor to Demetron, Inc., Union City, Calif.

Filed Jan. 12, 1984, Ser. No. 570,176
Int. Cl.[4] B22D *7/10*
U.S. Cl. 164—122 **12 Claims**



1. A method of casting a superalloy ingot which is a nickel- or cobalt-based alloy containing at least about 50% nickel or cobalt, respectively, and between about 10% and 20% chromium, from a stick at high vacuum comprising:

melting the stick using one or more electron beams to produce a substantially linear series of fully molten drops, each drop of which falls on the upper surface on an ingot being formed to cover a portion thereof which is substantially less than the ingot's total upper surface,

controlling the electron beam heating rate and the distance of the stick above the upper surface of the ingot such that each drop forms a film-like spatter having a surface dimension of between about 3.8 and 7.6 centimeters and wherein the thickness of the spatter is between about 0.04 mm and 0.08 mm,

providing relative movement between the stick and the ingot being formed at a rate which is high enough so that the successive drops will impinge upon different portions of the ingot's upper surface to lay down a series of substantially level close-packed arrays of overlapping spatters, each array covering the upper surface of the ingot substantially uniformly, but which rate of relative movement is low enough to prevent a substantial flow of the spatters on the surface of the ingot, and

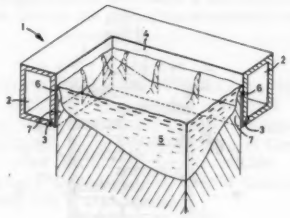
maintaining the drip rate such that the impact region on the ingot's upper surface is at or below the solidus temperature of the superalloy and above a temperature at which metallurgical bonding with the successive impinging drops can occur and such that the average rate of vertical buildup of the ingot is less than or equal to about one centimeter per minute and the drop pattern is sufficiently uniform to avoid successive drop impingements in the same area at intervals less than about three seconds to thereby avoid localized pooling.

4,558,730

METHOD OF AND APPARATUS FOR CONTINUOUSLY OR SEMI-CONTINUOUSLY CASTING METAL INGOTS

Masahiro Yoshida, and Susumu Inumaru, both of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,137
Claims priority, application Japan, May 13, 1982, 57-80596
Int. Cl.[4] B22D *11/00, 11/124*
U.S. Cl. 164—487 10 Claims



1. In a method of continuously or semi-continuously casting an ingot of rectangular cross section in a vertical open-ended direct chill mold having a coolant passageway, comprising the steps of (a) pouring molten metal into said mold, (b) providing a flow of coolant through said passageway and discharging the flow of coolant from the bottom of the mold, and (c) solidifying the poured molten metal by applying the discharged flow of coolant directly to the peripheral surface of the metal emerging from the bottom of the mold, the improvement which comprises:

a step of preventing a direct contact of said poured molten metal with an upper part of inner wall of said mold and controlling the cooling of the molten metal by said flow of coolant circulating in said passageway via said inner walls, said step of preventing the direct contact and controlling the cooling comprising interposing heat-insulating sheets between said upper part of the inner walls of the mold and the peripheral surface of the poured molten metal within the mold, said heat-insulating sheets each being dimensioned to satisfy the following formulas such that a central portion thereof extends downwardly into the mold to a greater extent than the end portions thereof:

$$0.2 \leqq V \cdot H_1 \leqq 0.7$$

$$\frac{V + 0.2}{V} \leqq H_2 \leqq \frac{4V + 0.7}{V}$$

$$L - 1.2T \leqq L_1 \leqq L - 0.6T$$

where,

V=casting speed (cm/sec),

H_1=distance between a lower end of said inner wall and a lower end of said heat-insulating sheet measured vertically of the mold at said central portion of the sheet on each side of the mold (cm),

H_2=distance between said lower end of the inner wall and said lower end of the sheet measured vertically of the mold at each corner of the mold (cm),

L=length of each long side of the mold (cm),

T=length of each short side of the mold (cm),

L_1=length of a lower central portion of said inner wall, not covered with said sheet, on said each long side of the mold horizontally extending with a height of H_1 from its center toward its ends over substantially equal lengths (cm).

10. An apparatus for continuously or semi-continuously casting an ingot of rectangular cross section, which comprises:

a vertical open-ended direct chill mold having four inner walls defining a mold cavity of rectangular cross section and further having a coolant passageway partially defined by said four inner walls; and

heat-insulating sheets covering upper parts of said four inner walls respectively to prevent molten metal poured into said mold cavity from directly contacting said upper parts of the inner walls and control the cooling of the poured molten metal by a flow of coolant circulating through said passageway via said inner walls, said heat-insulating sheets each being dimensioned to satisfy the following formulas:

$$0.2 \leqq V \cdot H_1 \leqq 0.7$$

$$\frac{V + 0.2}{V} \leqq H_2 \leqq \frac{4V + 0.7}{V}$$

$$L - 1.2T \leqq L_1 \leqq L - 0.6T$$

where,

V=casting speed (cm/sec.),

H_1=distance between a lower end of said inner wall and a lower end of said heat-insulating sheet measured vertically of the mold at said central portion of the sheet on each side of the mold (cm),

H_2=distance between said lower end of the inner wall and said lower end of the sheet measured vertically of the mold at each corner of the mold (cm),

L=length of each long side of the mold (cm),

T=length of each short side of the mold (cm),

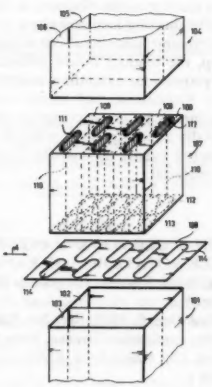
L_1=length of a lower central portion of said inner wall, not covered with said sheet, on said each long side of the mold horizontally extending with a height of H_1 from its center toward its ends over substantially equal lengths (cm).

4,558,731

CONTROL DEVICE FOR MEDIUM FLOWS FOR REGENERATIVE HEAT EXCHANGER

Ismo Pentikäinen, Järvenpää; Seppo Pentikäinen, Espoo, and Timo Pentikäinen, Joutseno, all of Finland, assignors to Orpocon Oy, Espoo, Finland

PCT No. PCT/FI83/00064, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/01617, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 17, 1983, Ser. No. 625,861
Claims priority, application Finland, Oct. 18, 1982, 823541; Aug. 16, 1983, 832942
Int. Cl.[4] F28D *17/00*
U.S. Cl. 165—4 3 Claims



1. Control device for medium flows for a regenerative heat exchanger, which is located between ductings (101, 104) di-

vided into medium flow ducts (**102, 103, 105, 106**) by means of at least one partition wall and which is, in the way of the ductings (**101**), divided into medium flow ducts (**105, 106**) by means of at least one partition wall, whereby the medium-flow control device consists of a cell (**107**) that is divided into compartments (**109**) by means of partition walls (**110**) parallel to the medium flows and substantially transverse to the partition wall between the ducts and whose ends are provided with plate elements (**108**) substantially transverse to the medium flows, at least one of the said plate elements being displaceable substantially in the transverse direction of the partition walls (**110**) of the cell and the said plate elements being provided with alternatingly located through openings (**111, 114**) and blocking members, whose area corresponds to the area of the opening between one medium-flow duct (**102, 103, 105, 106**) and at least one compartment (**109**) in the cell, characterized in that the control device is located between the ducting (**101**) and the heat exchanger (**104**) and that one of the plate elements of the control device is stationary and the other one (**108**) displaceable.

4,558,732

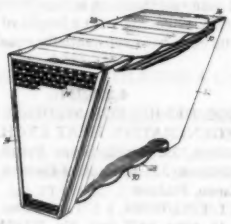
ELEMENT BASKET FOR ROTARY REGENERATIVE HEAT EXCHANGERS

Kenneth O. Bellows, Jacksonville, Fla., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed May 30, 1985, Ser. No. 739,392

Int. Cl.⁴ F28D *19/04*

U.S. Cl. 165—8 **4 Claims**



1. A basket of heat absorbent element sheets for a rotary regenerative heat exchanger having open ends that comprise inlet and outlet ports for the flow of fluid over the plates of the heat exchanger, said basket comprising a bundle of laterally abutting heat absorbent element sheets having generally longitudinal formations therein to permit the flow of fluid therethrough, spaced loading means disposed at opposite ends of the bundle of laterally abutting heat absorbent element sheets so as to hold the intervening heat absorbent element sheets in abutting relationship, the loading means providing a plurality of elastic loading projections extending essentially transverse to the longitudinal formations, and means interconnecting the spaced loading means so as to compress the loading means against the laterally abutting sheets whereby the loading projections are exerted evenly against the intervening sheets of heat absorbent material.

4,558,733

HEAT EXCHANGER HAVING INTERMITTENTLY MOVABLE ROTATIONAL CLEANING ARMS

Runar Lindroos, Frövi, Sweden, assignor to Rilett Engergitjänst AB, Frövi, Sweden

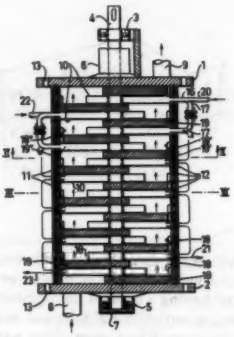
Filed Dec. 8, 1981, Ser. No. 328,728

Claims priority, application Sweden, Dec. 17, 1980, 8008880

Int. Cl.⁴ F28G *3/10, 15/04, 15/08*

U.S. Cl. 165—94 **4 Claims**

1. A heat exchanger for exchanging heat between a first medium and a second medium, one of the media including incrusting substances, comprising a pair of end walls, one of the end walls having an inlet for the first medium and the other end wall having an outlet for the first medium; a rotary shaft extending between the end walls; means for rotating the shaft so as to drive the shaft intermittently at preselected intervals of operation; a plurality of disc-shaped hollow members each having a central passage for the shaft and a through opening located on a side of the passage, the through opening being sealed from the interior of the member; said disc-shaped hollow members having an inlet and an outlet for the second medium; cleaning arms non-rotatably connected to and extending radially from the shaft, a cleaning arm and a member alternating between the first and second end walls such that each of the cleaning arms by rotation of the shaft moves either between adjacent members or between an end wall and a member adjacent to the respective end wall wherein the openings of two of said adjacent members are offset by 180° about the shaft in relation to each other; and, the cleaning arms in an inoperative state extending substantially centrally over the opening of the respective member whereby an area of the opening of substantially equal size is located on each side of the cleaning arm.



4,558,734

HEAT EXCHANGER HAVING A SET OF PIPES

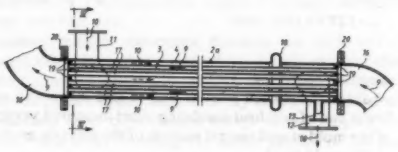
Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,852

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 8210809

Int. Cl.⁴ F28B *1/00*

U.S. Cl. 165—113 **5 Claims**



1. A heat exchanger construction comprising a plurality of vertically spaced apart tubes arranged adjacent and alongside one another, each of said tubes having substantially horizontal run; sealing means at opposite ends of each of said tubes and closing the associated run; a plurality of spaced apart pipes open at both ends thereof accommodated within each of said tubes and extending along the run thereof and through the sealing means at both ends of said run; an inlet adjacent one end of each of said tubes inward of the associated sealing means for introducing a heating medium into the associated run; an outlet in communication with and adjacent the opposite end of each of said tubes at a level angularly offset from its bottom and

inward of the associated sealing means for extracting said heating medium from the associated run; a drain in communication with the bottom of each of said tubes adjacent said opposite end and inward of the associated sealing means for draining the tube; U-shaped connector means connecting an end of each of said tubes to an end of an adjacent tube whereby the contents of said pipes may pass from tube to tube; means for introducing fluid to be heated to the pipes within an endmost one of said tubes; and means for discharging such fluid from the pipes within the opposite endmost tube, the inlet and outlet of each of said tubes being so located that the flow of heating medium through each of said tubes is countercurrent to the flow of fluid through the pipe of the associated tube.

4,558,735

HEAT EXCHANGER HAVING A METAL BAFFLE PLATE SECURED TO A STEEL MEMBER

Klaus Meike, Siegen, Fed. Rep. of Germany, assignor to Schaefer Werke GmbH, Neunkirchen, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,360

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237143; Feb. 1, 1983, 3303237

Int. Cl.⁴ F28F *21/08*

U.S. Cl. 165—131 **25 Claims**

1. A heat exchanger, comprising a steel member and at least one heat baffle plate which is connected heat-conductingly to and projects outwardly from said steel member, wherein said heat baffle plate is made of a metal having a heat conductivity greater than the heat conductivity of steel, wherein said heat baffle plate is held against said steel member by a further member which is welded to said steel member, and wherein said further member is a steel plate which rests against said heat baffle plate and in plural locations has portions which project through openings in said heat baffle plate, each said portion being welded to said steel member.

4,558,736

HEAT EXCHANGER, PARTICULARLY FOR SOLAR COLLECTORS AND METHOD OF MANUFACTURE THEREFOR

Gerhard Ziemek, Langenhagen, Fed. Rep. of Germany, assignor to Kabelmetal Electro Gesellschaft mit beschränkter Haftung, Haaover, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,739

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238943

Int. Cl.⁴ F28F *1/14*; F24J *3/02*

U.S. Cl. 165—183 **16 Claims**

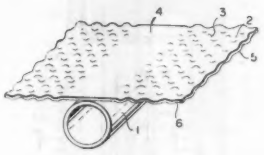
1. A heat exchanger element formed by a method of making a heat exchanger element comprising the steps of

continuously feeding a metal tube,

continuously feeding a metal sheet having longitudinal edges towards the continuously fed metal tube such that the tube is longitudinally centrally between the longitudinal edges of the metal sheet, the width of the metal sheet being greater than the cross sectional dimension of the tube,

metalurgically connecting the metal sheet to the metal tube by through-welding so as to form a heat exchange element, the metal sheet being welded at a line of contact to the metal tube centrally between the longitudinal edges of the sheet,

plastically deforming the longitudinal deformation regions of the sheet along both lateral sides of the tube respectively between the longitudinal edges of the sheet leaving a central longitudinal undeformed region of the sheet in the vicinity of the tube, by passing the heat exchange element through a pair of deforming rollers which deform the sheet to form the dimple-shaped plastic deformations in the sheet at the deformation regions, the dimples being formed in the surface of the sheet extending from opposite



sides, the dimples being shaped in the form of substantially spherical segments, with the depth of the dimples, measured from an undeformed plane of the sheet, being substantially between 0.1 and 0.7 mm and the radius of curvature of the spherical segments being substantially between 0.3 and 4 mm, and

transversely cutting the sheet and tube to size to form the heat exchanger element.

4,558,737

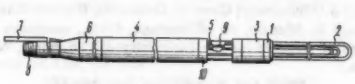
DOWNHOLE THERMOACOUSTIC DEVICE

Oleg L. Kuznetsov, Leninsky prospekt, 69, korpus 3, kv. 379; Rafkhat A. Maxutov, Leninsky prospekt, 67, kv. 164; Vladimir O. Malchenok, Teply Stan, 2-y mikroraion, 29, kv. 39; Khanuko M. Mordukhaev, ulitsa Millionschikova, 15, kv. 13; Anatoly P. Ostrovsky, Lomonosovsky prospekt, 14, kv. 312; Adolf E. Rubtsov, ulitsa Yartsevskaya, 27, korpus 5, kv. 30; Ernst M. Simkin, ulitsa Novoalexeevskaya, 1, kv. 16, and Alexei V. Sokolov, prospekt Mira, 112, kv. 255, all of Moscow, U.S.S.R.

Filed Dec. 18, 1981, Ser. No. 332,160

Int. Cl.⁴ E21B *36/04*

U.S. Cl. 166—60 **37 Claims**



1. A downhole thermoacoustic device comprising:

a radiator of acoustic oscillation;

a heater with a terminal chamber, connected to said radiator of acoustic oscillation, said radiator of acoustic oscillation including:

a hollow housing;

a longitudinal shaft mounted internally of said hollow housing;

coils successively mounted on said longitudinal shaft;

cores of said coils having at least one active element;

said active element being adapted for generating acoustic oscillation, and

said core of said coil being hollow;

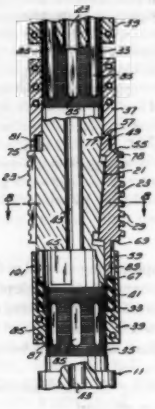
a reflector of acoustic oscillation mounted internally of said core on said longitudinal shaft, said reflector of acoustic oscillation being adapted for intensifying the acoustic oscillation in the radial direction.

4,558,738

OIL WELL CASING SCRAPER

Robert G. Howard, Sr., P.O. Box 683, Alta Loma, Calif. 91701

Filed Apr. 2, 1984, Ser. No. 596,005
Int. Cl.[4] E21B *37/02*
U.S. Cl. 166—173 **16 Claims**



14. A well casing scraper comprising:

an elongate single piece mandrel having a pair of axially separated blade mounting structures;

two sets of blade pieces, each set of blade pieces comprising a plurality of individual blade pieces mounted on the blade mounting structures, wherein the blade pieces and the blade mounting structures interact so axial movement of a blade piece causes radial movement of the blade piece;

a set of upper and lower collars for each set of blade pieces for independently controlling axial movement of each set of blade pieces;

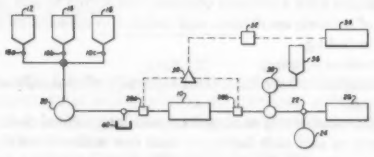
a resilient sleeve between each set of blade pieces and the lower collar for that set of blade pieces, the sleeve allowing limited axially downward movement of the blade pieces.

4,558,739

SITU MICROBIAL PLUGGING PROCESS FOR SUBTERRANEAN FORMATIONS

Michael J. McInerney; Gary E. Jenneman; Roy M. Knapp, and Donald E. Menzie, all of Norman, Okla., assignors to The Board of Regents for the University of Oklahoma, Norman, Okla.

Filed Apr. 5, 1983, Ser. No. 482,316
Int. Cl.[4] E21B *43/22, 33/138*
U.S. Cl. 166—246 **75 Claims**



1. A process for selectively impeding the flow of aqueous fluid through a permeable subterranean formation containing indigenous bacteria, comprising:

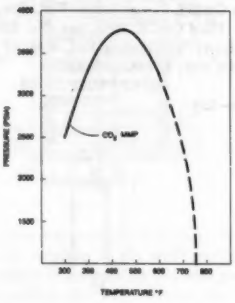
injecting through at least one access into the subterranean formation a quantity of bacterial nutrient capable of sustaining bacterial proliferation, such nutrient comprising a source of metabolizable carbon and a source of metabolizable nitrogen.

4,558,740

INJECTION OF STEAM AND SOLVENT FOR IMPROVED OIL RECOVERY

William F. Yellig, Jr., Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 499,060, May 27, 1983, now abandoned.
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—272 **12 Claims**



1. A method of recovery of oil from a subterranean oil-bearing reservoir, said reservoir having a predetermined reservoir fracture pressure and a reservoir temperature, comprising:

(a) injecting into said reservoir an oil-recovery fluid, wherein a mixture of said oil recovery fluid and said oil has a minimum miscibility pressure at the ambient reservoir temperature which is higher than the reservoir fracture pressure,

(b) injecting steam into said reservoir such that the temperature of said mixture of said oil and said oil recovery fluid is elevated above the ambient reservoir temperature to a temperature at which the minimum miscibility pressure at the elevated temperature is lower than the reservoir fracture pressure and,

(c) miscibly displacing said reservoir oil through said reservoir at a pressure below the reservoir fracture pressure.

4,558,741

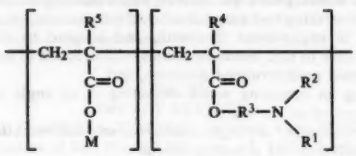
METHODS OF MINIMIZING FINES MIGRATION IN SUBTERRANEAN FORMATIONS

John K. Borchardt, and Bill M. Young, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 28, 1984, Ser. No. 584,379
Int. Cl.[4] C09K *17/00;* E21B *43/22, 43/26, 43/27*
U.S. Cl. 166—275 **20 Claims**

14. A method of stabilizing fines within an earthen formation comprising:

contacting said formation with an effective amount of an organic copolymer having a molecular weight of from about 1,000 to about 3,000,000 and having recurring structural monomer units formed in a random fashion of the formula:



I II

wherein

R^1 and R^2 are independently methyl, ethyl, hydroxyethyl or hydroxymethyl;

R^3 is an unsubstituted alkylene group having from about 2 to about 4 carbon atoms or a substituted alkylene group having from about 2 to about 4 carbon atoms and containing a hydroxy group;

R^4 is methyl or ethyl;

R^5 is hydrogen or methyl;

M is a hydrogen or an alkali metal;

and,

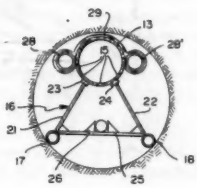
monomer unit I is present in the range of from about 5 to about 30 percent by weight of the copolymer and monomer unit II is present in the range of from about 70 to about 95 percent by weight of the copolymer.

4,558,742

METHOD AND APPARATUS FOR GRAVEL PACKING HORIZONTAL WELLS

Wann-Sheng Huang, and Alfred Brown, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,506
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—278 **5 Claims**



1. Well completion for a wellbore formed into a subterranean formation comprised of unconsolidated sand particles which releasably hold a visous hydrocarbon, which wellbore extends substantially horizontally of and coextensively with said subterranean formation, which completion includes;

an elongated perforated well liner registered in said wellbore and spaced from the walls thereof to define an annular chamber therebetween,

a gravel pack comprising an unconsolidated mass of particulated gravel which occupies said annular chamber to filter a flow of said viscous hydrocarbon liquid in which sand particles are entrained, and

well liner positioning means disposed in said wellbore and supportably engaging said well liner,

whereby at least some of said sand particles will be retained in the gravel pack to permit the passage of flowable hydrocarbon through gravel pack and into the perforated well liner,

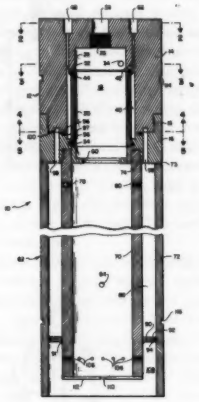
said well liner support means including skid means having at least two laterally spaced apart, and longitudinally continuous skids resting on the wellbore lower wall, and support means extending upwardly from said continuous skids in supporting relationship to said well liner.

4,558,743

STEAM GENERATOR APPARATUS AND METHOD

Norman W. Ryan, and Angelo Peperakis, Jr., both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jun. 29, 1983, Ser. No. 509,285
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—303 **37 Claims**



1. An apparatus for producing steam in a confined area, said apparatus comprising:

a combustion section with a reaction chamber forming a part thereof, said combustion section having means for mixing fuel and oxygen such that a vortex-stabilized flame is formed within said reaction chamber during combustion;

an orifice positioned below said reaction chamber;

means for cooling the walls of the reaction chamber around the flame, said cooling means comprising porous sintered material forming a portion of the walls of the reaction chamber above the orifice such that water can flow through the sintered material; and

means for combining water with combustion products from the reaction chamber such that the combustion products can vaporize the water to form steam.

4,558,744

SUBSEA CAISSON AND METHOD OF INSTALLING SAME

Peter R. Gibb, Port Coquitlam, Canada, assignor to CanOcean Resources Ltd., Canada

Filed Sep. 13, 1983, Ser. No. 531,682
Int. Cl.[4] E21B *7/18*
U.S. Cl. 166—335 **14 Claims**

1. A method of sinking and securing a caisson in a hole in a seabed, said caisson having a detachable top cover, an open bottom and a removable, self-contained soil-fluidizing and removal means including a plurality of jetting means spaced circumferentially about the inside of the wall of said caisson adjacent the lower end thereof and a suction head located adjacent the lower end of the caisson; said method comprising the steps of:

(a) lowering the caisson to the seabed surface so that the open bottom engages the surface of seabed;

(b) actuating said plurality of jetting means to fluidize said soil in the areas adjacent a lower edge of the inside of the caisson wall and the suction head;

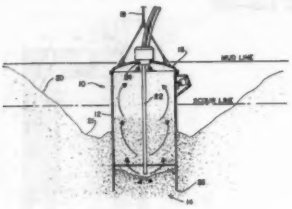
(c) removing said fluidized soil via the suction head from the confines of the caisson during actuation of said jetting means;

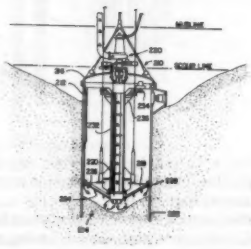
(d) forming said hole and sinking said caisson simultaneously

to a depth below a predetermined scour line by hydrostatic pressure, said self-contained soil-fluidizing and removal means effecting said forming and said sinking; and

(e) removing said top cover and said soil-fluidizing and removal means.

13. A subsea caisson for installation in a seabed comprising,





an elongated cylindrical housing having a removable top and a base mounted for rotation inwardly of the lower end of the cylindrical body, said base having a plurality of cutters on its lower surface for engaging the surface of the seabed; bearing means on the inner wall of said caisson mounting said base means thereto; a water jet manifold ring and a plurality of jet means mounted on the caisson wall below said base.

4,558,745

MACHINE FOR WORKING SOIL HAVING DRIVINGLY OSCILLATED SOIL-WORKING TOOL

Carl Ley, Düren, Fed. Rep. of Germany, assignor to Bucher Guyer A.G., Niederweningen, Switzerland

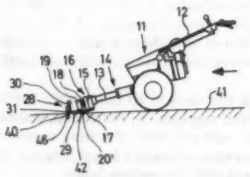
PCT No. PCT/CH81/00108, § 371 Date Jun. 2, 1982, § 102(e) Date Jun. 2, 1982, PCT Pub. No. WO82/01114, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 30, 1981, Ser. No. 395,083

Claims priority, application Switzerland, Oct. 2, 1980, 7353/80

Int. Cl.[4] A01B *19/06*; B62D *51/04*

U.S. Cl. 172—42 **8 Claims**



1. A machine for working soil, and arranged to have a predetermined direction of movement,

comprising in combination:

mounting means,

a soil-working tool mounted on said mounting means, said soil working tool adapted to be driven over the soil, and to be in engagement therewith, and adapted to oscillate relative to said mounting means in a direction at an angle to said predetermined direction, and

having an operating width extending at an angle to said direction of movement,

drive means for drivingly oscillating said soil-working tool relative to said mounting means,

said soil-working tool having approximately an angular cross-section, and including two blades forming an apex, one of said blades extending from said apex in a direction opposite to said direction of movement, and being adapted to extend substantially parallel to the soil, the other of said blades extending in an upright direction, substantially at right angles to said one of said blades, and

a plurality of prongs arranged on said soil-working tool along said operating width, said prongs adapted to extend downwardly towards the soil, and being disposed on a front side of said upright blade of said soil working tool, said front side facing away from said blade adapted to extend substantially parallel to the soil.

4,558,746

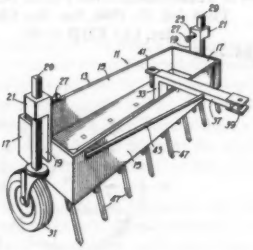
LAWN WORKING IMPLEMENT

John J. Powell, 6991 Power St., Riverdale, Ga. 30274, and Herbert L. Powell, 9192 Fayetteville Rd., Jonesboro, both of Ga. 30236

Filed Jan. 13, 1984, Ser. No. 570,522

Int. Cl.[4] A01B *45/00*

U.S. Cl. 172—421 **7 Claims**



1. An implement for working a lawn, comprising:

(a) a frame comprising two transverse angle iron members welded to two longitudinal angle iron members to form a cavity in its upper surface to receive ballast for varying the weight of the implement and the pressure exerted on the ground being worked;

(b) two wheel brackets made of flat iron, each welded to a side portion of the frame;

(c) two strut mounts of square tubing, each welded to the upper portion of a wheel bracket, and each having a set screw placed in a threaded orifice in the mount;

(d) two struts made of steel rod, each held in place in one of the strut mounts by one of the set screws;

(e) two casters, each connected to the bottom portion of one of the struts;

(f) a forward and an after row of tines connected to the lower portion of the frame so that the angle defined by the forward surface of each tine and the bottom surface of the frame forward of the tine is between 75 degrees and 85 degrees;

(g) a tongue mount of channel iron welded to the forward portion of the frame;

(h) a tongue of channel iron welded to the upper portion of the tongue mount, for connecting the implement to a motive means; and

(i) an after hitch welded to the rear portion of the tongue comprising a flat iron piece having a hole drilled therethrough, for towing a vacuum, sweeping or other apparatus behind the implement.

4,558,747

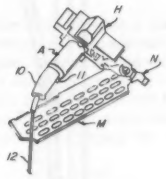
IMPACT DEVICES

James D. Cunningham, 2100 Topaz, Boulder, Colo. 80302

Continuation of Ser. No. 407,089, Aug. 11, 1982, abandoned. This application Jan. 15, 1985, Ser. No. 691,377

Int. Cl.[4] E21B *1/00*

U.S. Cl. 173—55 **19 Claims**



1. An impact device comprising:

A. a housing;

B. a ram means mounted on said housing for reciprocating movement for delivering an impact to an object and returning to a rest position;

C. ram moving means for moving said ram means from said rest position to impact an object and for accelerating said ram means to a desired impact velocity, said ram moving means including:

(1) two flywheels pivotably mounted on said housing adjacent to aaid ram means for movement from ready positions spaced from said ram means toward each other and into abutting contact with said ram means,

(2) flywheel moving means for moving said flywheels from said ready positions toward each other and into abutting contact with said ram means and away from each other back to said ready positions, said flywheel moving means including

(a) a workpiece engaging means for moving said flywheels toward each other and into abutting contact with said ram upon engaging a workpiece and

(b) flywheel return means on said housing for biasing said flywheels away from each other and toward said ready positions and moving said flywheels back to said ready positions when said workpiece engaging means is not engaging a workpiece; and

(3) flywheel rotating means for rotating each of said flywheels in a direction to drive said ram means toward an impact delivering position upon engagement with said ram means, said flywheel rotating means including

(a) a motor having a drive shaft,

(b) a first pulley means associated with each flywheel and rotatably mounted on aaid housing, each of said first pulley means including a V-shaped peripheral groove,

(c) coupling means for coupling each of said first pulley means together to rotate together but in opposite directions,

(d) connecting means mounted on said housing for connecting said motor to one of said first pulley means for rotating said first pulley means,

(e) a second pulley means connected to each flywheel and rotatably mounted on said housing,

(f) a V-shaped belt means for connecting each of said second pulley means to an associated one of said first pulley means to rotate said second pulley means in correspondence with rotation of said associated first pulley means,

(g) each of said second pulley means including a compound groove means extending from an inner portion of each of said second pulley means to the outer peripheral edge of said second pulley means for accommodating said belt means, said compound groove means including

a V-shaped portion which is located adjacent to the inner portion of said second pulley means and which is sized and shaped to receive said V-shaped belt means snugly enough so that movement of said belt means is transferred to said second pulley means, said V-shaped portion being located to snugly receive said belt means when said flywheels are in said ready positions whereby rotation of said motor drive shaft is transmitted to said flywheels to rotate said flywheels at a predetermined speed, said flywheel return means biasing said second pulley means V-shaped groove portions against said V-shaped belt means when said flywheels are in said ready positions, and

a second portion having side walls which are spaced apart far enough so said second pulley means is disconnected from said belt means when said second pulley means is positioned to have said belt means located in said groove means second portion whereby said flywheels are disconnected from said motor when said belt means is located in said groove second portion and rotate under their own inertia for driving said ram means, said groove means second portion being placed on said second pulley means to have said belt means positioned therein after said flywheels have been moved out of said ready positions and have been moved toward each other by said flywheel moving means.

4,558,748

METHOD AND EQUIPMENT FOR BORING AND CASING AIR VENT HOLES AND/OR DELIVERY HOLES IN MEDIUM-STEEP AND STEEP DIP COAL DEPOSITS AND ROCKS OF LOOSE STRUCTURE

György Gergo, Pécs; József Németh, Budapest; Béla Sebestyén, Pécs, and Zoltán Vida, Komló, all of Hungary, assignors to Gepipari Technologiai Intezet, Budapest and Mecseki Szenbanyak, Pécs, both of, Hungary

Continuation of Ser. No. 515,363, Jul. 19, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,314

Claims priority, application Hungary, Jul. 20, 1982, 2347/82

Int. Cl.[4] E21B *19/00*

U.S. Cl. 175—57 **1 Claim**

1. A method of forming a hole between lower and upper parallel galleries formed in medium steeped and steep dip coal deposits and rock of loose structure, comprising the steps of:

(a) boring upwardly from said lower gallery with a boring crown at the end of an upright drill rod a bore hole having a first length equal to a fraction of the distance between said lower and upper galleries;

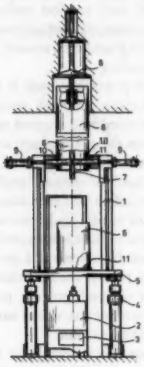
(b) casing said bore hole by thrusting upwardly independently of the upward advance of said drill rod at least one pipe section having a diameter sufficient to be gripped by the shrinkage of said bore hole into said bore hole to a point substantially adjacent said boring crown, whereby said drill rod extends through said pipe section;

(c) boring upwardly further after casing said first length with said at least one section by a further length equal to a fraction of the distance between said lower and upper galleries;

(d) casing the newly formed further length of said bore hole by thrusting upwardly through any previously disposed pipe sections into said newly formed further length of said bore hole at least one further pipe section so that said further pipe section extends beyond said previously dis-

posed pipe sections, said one further pipe section having a diameter less than the inside diameter of said any pipe sections previously disposed in said bore hole and sufficient to be gripped by the shrinkage of the newly formed further length of the bore hole; and

(e) repeating steps (c) and (d) until the upper gallery is reached.

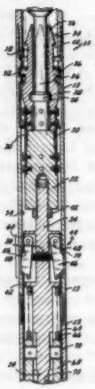


4,558,749

ANTI-JAMMING CORE BARRELS

Larry R. Fulkerson, Sandy, Utah, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed Oct. 17, 1983, Ser. No. 542,386
Int. Cl.[4] E21B *25/00*
U.S. Cl. 175—58 **19 Claims**



1. In a rotary jar in a coring tool including an outer tube coupled to a coring bit and concentrically disposed therein an inner tube for receiving a core cut by said coring bit, an improvement comprising:

a rotary hammer concentrically disposed in said outer tube and rotatable therewith;

an anvil for receiving and transmitting impulsive shocks from said rotary hammer, said anvil being connected to said inner tube, said impulsive shocks being transmitted from said hammer through said anvil to said inner tube to jar said inner tube free when said inner tube becomes jammed about said core; and

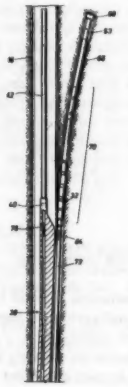
means for automatically and for selectively engaging said hammer and anvil without operator intervention only when said inner tube jams in order to automatically, selectively and intermittently generate said impulsive shocks therebetween.

4,558,750

METHOD AND APPARATUS FOR FORMING BOREHOLES

James A. Burton; Hubert L. Elkins, and Milton E. Goodhart, all of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Aug. 3, 1984, Ser. No. 637,425
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—61 **5 Claims**



3. A carriage assembly adapted for use in drilling an upardly directed deviated well borehole comprising,

a carriage housing having

an upper end and a lower end,

an upper coupling means disposed at the upper end of said housing for coupling with a first tubular member,

a first passage extending through said housing from said upper end to said lower end, said first passage in fluid communication with said first tubular member,

a second passage through said housing, the upper end of said second passage being open to the well borehole and beginning a predetermined distance below the upper end of said carriage housing, said second passage extending to the lower end of said carriage housing and being in fluid communication with said first passage at the lower end of said carriage housing, and

a stripper packer means disposed in the lower end of said carriage housing adapted for sealingly engaging a second tubular member extending through the second passage operably preventing fluid from said first passage from passing above said stripper packer means about the exterior of said second tubular member while allowing fluid from said first passage to pass through said second tubular member.

4,558,751

APPARATUS FOR TRANSPORTING EQUIPMENT THROUGH A CONDUIT

Roger W. Huffaker, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

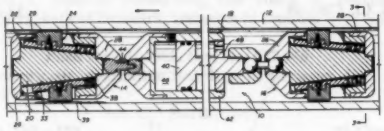
Filed Aug. 2, 1984, Ser. No. 637,177
Int. Cl.[4] B65H *59/00*; E21B *43/00*; E21C *29/16*; H02G *1/08*
U.S. Cl. 175—99 **18 Claims**

1. Apparatus adapted to propel itself through a fluid-bearing conduit in response to varying the pressure of the fluid within said conduit, said apparatus comprising:

a first wedge and slip assembly, said first wedge and slip

assembly being moveable through said conduit in a first axial direction and being adapted to resist being moved in the opposed axial direction;

a second wedge and slip assembly, said second wedge and slip assembly being moveable through said conduit in said first axial direction and being adapted to resist being moved in the opposed axial direction, said second wedge



and slip assembly being situated a spaced axial distance from said first wedge and slip assembly; and,

means for biasing said first and second wedge and slip assemblies toward one another in response to bringing the conduit fluid to a first pressure level and for urging said first and second wedge and slip assemblies away from one another in response to bringing the conduit fluid to a second pressure level.

4,558,752

DEVICE FOR OBTAINING DUST FROM MINERALS

Hans-Ulrich Freund, Friedrichsdorf; Wolfgang M. Heide, Darmstadt, and Rolf A. Sieglen, Sulzbach, all of Fed. Rep. of Germany, assignors to Luossavaara Kiirunavaara AB, Stockholm, Sweden

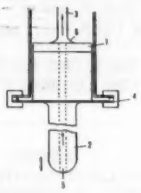
PCT No. PCT/EP80/00011, § 371 Date Oct. 27, 1980, § 102(e) Date Oct. 27, 1980, PCT Pub. No. WO80/01838, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 22, 1980, Ser. No. 212,729

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907514

Int. Cl.⁴ E21C *39/00, 37/26, 37/20*

U.S. Cl. 175—207 **13 Claims**



1. Device for obtaining samples from minerals during the mining comprising an excitation part for mechanical ultrasonic vibrations combined with a chisel, which has a tip, and a suction device, the chisel being able to produce only dust of particle size of about 10 to 100 μm as sample for X-ray fluorescence analysis as a result of the reduction of the cross-section of the chisel in comparison to the cross-section of the excitation system and mechanically fixing the device in the nodal plane λ/4 by a nodal mounting and the suction device having a suction nozzle to collect the dust sample produced.

4,558,753

DRAG BIT AND CUTTERS

John D. Barr, Cheltenham, United Kingdom, assignor to NL Industries, Inc., New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,669

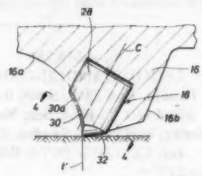
Int. Cl.⁴ E21B *10/46*

U.S. Cl. 175—329 **26 Claims**

1. A drag-type well-drilling bit comprising:

a bit body having an operating end face;

and a plurality of self-sharpening cutting members mounted in said bit body and extending through said operating end face, said cutting members having cutting faces adapted to engage an earth formation and cut the earth formation to



a desired three dimensional profile, said cutting faces defining surfaces having back rake angles which become more negative with distance from said profile.

4,558,754

DRILL BIT HAVING ANGLED NOZZLES

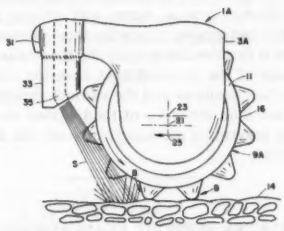
John S. Childers, Greenville, and Paul E. Pastusek, Houston, both of Tex., assignors to Reed Rock Bit Company, Houston, Tex.

Continuation-in-part of Ser. No. 437,927, Nov. 1, 1982, Pat. No. 4,516,642, which is a continuation-in-part of Ser. No. 132,950, Mar. 24, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 573,245

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.⁴ E21B *10/18*

U.S. Cl. 175—340 **20 Claims**



1. A rotary drill bit for drilling a well bore, the bit comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to a drill string for rotating the bit and delivering drilling fluid under pressure to the bit, a plurality of depending legs at its lower end, each leg being spaced from the other legs, and a plurality of nozzles for exit of the drilling fluid from the bit body; and

a plurality of roller cutters, one for each leg, each roller cutter comprising a generally conical cutter body rotatably mounted on the respective leg and a plurality of cutting elements on the cutter body, the cutter body at least for a portion of its conical surface being formed of a material resistant to erosion by high velocity drilling fluid which may impinge it;

each of said nozzles having passaging therein directing the drilling fluid under pressure to exit the bit body in a stream angled relative to the longitudinal axis of the drill bit and flowing generally toward the underside of the cutter body of an adjacent roller cutter constituted by the half of the roller cutter below its axis of rotation, impinging at least one cutting element on the cutter body, and thereafter impinging a portion of the bottom of the well bore forward, with respect to the direction of rotation of the bit, of the bottom of the adjacent roller cutter, whereby during use of the drill bit the drilling fluid sequentially impinges

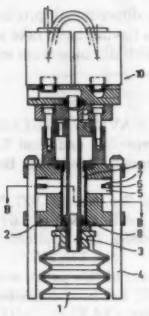
and cleans the cutting elements and then portions of the well bore bottom immediately prior to the engagement of said portions of the well bore bottom by the cutting elements for enhanced drill bit cutting action.

4,558,755

FOOD HANDLING DEVICE

Bengt A. G. Lundin, Box 2265, S-600 02 Norrköping, Sweden

Filed Oct. 5, 1984, Ser. No. 658,246
Claims priority, application Sweden, Oct. 5, 1983, 8305479
Int. Cl.⁴ G01G *19/14*; B66C *1/02*
U.S. Cl. 177—147 **8 Claims**



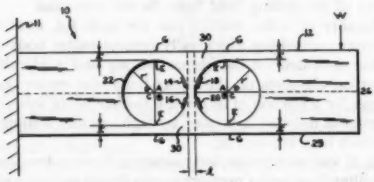
1. Device for ridgedly holding, handling and lifting pieces of food with irregular and differing shape, characterized in that it includes flexible suction means and around these parallel contact pins and locking means for these contact pins, so that when used at first the contact pins and the suction means adjust to the shape of the piece of food, then the contact pins are locked in their positions and the suctions means are activated to draw and hold the piece of food against the contact pins firmly and preventing movement between the device and the piece of food.

4,558,756

CANTILEVER SUPPORT BEAM ASSEMBLY FOR A LOAD CELL AND THE LIKE

Aniese E. Seed, Toledo, Ohio, assignor to Toledo Transducers, Inc., Toledo, Ohio

Filed Apr. 23, 1984, Ser. No. 602,670
Int. Cl.⁴ G01G *3/08, 3/14*
U.S. Cl. 177—211 **7 Claims**



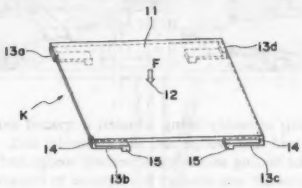
1. A cantilever beam assembly for a load cell comprising a longitudinally extending support beam having opposed sidewalls, two adjacent parallel and independent openings extending completely through the sidewalls of said beam, said beam completely surrounding each of said independent and parallel openings, a vertical web between said two openings and gages located adjacent said vertical web in at least one of said two openings.

4,558,757

POSITION COORDINATE INPUT DEVICE

Yoshihiro Mori, Kadoma; Osamu Yamamoto, Hirakata, and Kazumasa Yamamoto, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 31, 1984, Ser. No. 615,534
Claims priority, application Japan, Jun. 6, 1983, 58-101122
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—18 **12 Claims**



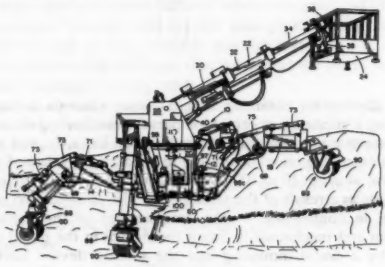
1. A position coordinate input device comprising:
an input plate;
four elastic support members for supporting said input plate;
four detector means for detecting that an external force has been applied to a point on said input plate, which are, respectively, provided on said elastic support members and are constituted by a pair of two first detector means yielding outputs having temperature characteristics of a first sign and a pair of two second detector means yielding outputs having temperature characteristics of a second sign opposite to the first sign; and
a circuitry for outputting, in response to said outputs from said four detector means, data of coordinates of said point, which data are corresponding to said outputs.

4,558,758

PRIME MOVER

Erwin J. Littman, 4466 N.-600 W, LaPorte, Ind. 46350, and Glen L. Anderson, Ukiah, Calif., assignors to Erwin Littman, LaPorte, Ind.

Filed Dec. 2, 1983, Ser. No. 557,211
Int. Cl.⁴ B62D *57/02*
U.S. Cl. 180—8.1 **19 Claims**



1. A prime mover comprising a central housing, a plurality of elongated legs, mounting means for mounting said legs on said central housing so as to permit movement of the legs both up and down and sideways relative to the central housing, drive means on each of said legs, control means for independently actuating each of said drive means for moving the central housing, said legs being adapted to be positioned so as to stabilize the orientation of the central housing, said mounting means including first pivot means for enabling movement of the legs up and down relative to the central housing and second pivot means for enabling movement of the legs sidewise relative to the central housing, and third pivot means on said

legs for enabling movement of the drive means inwardly and outwardly with respect to the central housing.

4,558,759

HYDROSTATIC STEERING DEVICE STEERING WHEEL TRAVEL LIMITS

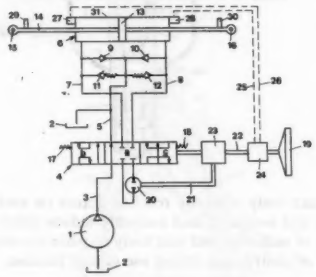
Johannes V. Baatrup, Sonderborg, and Harry E. Pedersen, Nordberg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Dec. 1, 1983, Ser. No. 557,065

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246137

Int. Cl.⁴ B62D *5/06*

U.S. Cl. 180—132 **10 Claims**



1. A hydrostatic steering system, comprising, pump and tank means, a steering servomotor having two control ports, valve means having right and left turn positions for directing pressurized fluid from said pump means to either of said control ports and directing exhaust fluid from the other of said control ports to said tank means, steering means for controlling said valve means including shaft means, moveable means moveably responsive to the operation of said servomotor, limiting position sensor means responsive to movement of said moveable means to a limiting position, and locking apparatus means responsive to said sensor means for mechanically stopping movement of said steering shaft means.

4,558,760

APPARATUS FOR AUTOMATICALLY GUIDING THE MOVEMENT OF A VEHICLE, ESPECIALLY AN OFF-ROAD VEHICLE

Denis Lestradet, Fere Champenoise, France, assignor to Preciculture, France

Filed Jan. 20, 1983, Ser. No. 459,348

Claims priority, application France, Jan. 22, 1982, 82 00995

Int. Cl.⁴ B62D *1/00*

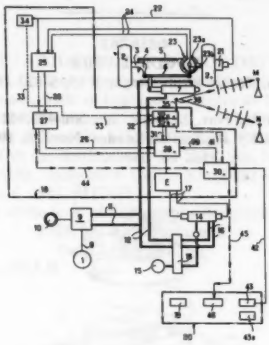
U.S. Cl. 180—169 **12 Claims**

1. Apparatus for automatically guiding the movement of a vehicle having at least one steerable wheel comprising:

desired path means for producing desired path data defining positionable parameters of a desired path to be followed by the vehicle, said means including memory means for storing signals defining said desired path data, including operator established data relating to the desired spacing between successive passes of the vehicle;

detector means having opto-electric pulse generating means coupled to said wheel for detecting the distance traveled by the vehicle and potentiometer means coupled to said wheel and responsive to the movement of same for detecting the steering angle of the steered wheel, said detector means providing signals defining detected position data;

comparison means comprising computing and regulating means responsive to said desired path data and said detected position data for producing a deviation signal relating to deviation of the vehicle from said desired path; and



steering control means responsive to said deviation signal for controlling the vehicle steering to bring said vehicle toward said desired path.

4,558,761

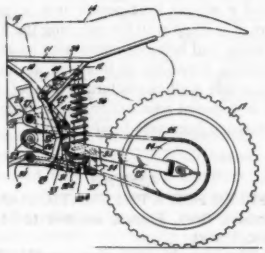
MOTORCYCLE DRIVE WHEEL SUSPENSION SYSTEM

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 544,091, Oct. 21, 1983, which is a continuation-in-part of Ser. No. 513,311, Jul. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 368,220, Apr. 14, 1982, Pat. No. 4,408,674. This application Feb. 6, 1984, Ser. No. 577,026

Int. Cl.⁴ B62K *25/04*

U.S. Cl. 180—227 **6 Claims**



1. In a motorcycle having a frame, a drive wheel, a motor, and wheel drive mechanism including a motor sprocket, a wheel sprocket, and a drive chain connecting the sprockets, a drive wheel suspension system comprising first and second levers pivotally mounted on first and second axes spaced one above the other in a first generally upright plane in the region of the axis of the motor sprockets, first linkage pivotally interconnecting said levers on second axes in a second generally upright plane between the motor and wheel sprockets, a swing arm for the drive wheel extended forwardly of the wheel sprocket and pivotally connected with said first linkage on a transverse axis between the motor and wheel sprockets, one of said levers having an extension beyond said first linkage to a position vertically offset from the swing arm, a swing arm link extended between the swing arm and said lever extension, a first pivot joint connecting the swing arm link with the swing arm and a second pivot joint connecting the swing arm link with said lever extension, said second pivot joint being closer

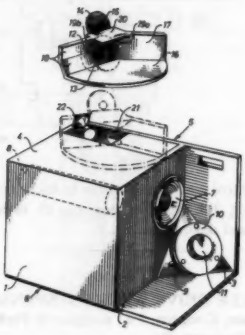
to the first linkage than said first pivot joint, and means connected with the wheel suspension system for resisting drive wheel deflection.

4,558,762

LOUDSPEAKER

Stig Carlsson, Torkel Knutssonsgatan 15, S-117 25 Stockholm, Sweden

Filed Nov. 23, 1982, Ser. No. 443,941
Claims priority, application Sweden, Nov. 26, 1981, 8107049
Int. Cl.[4] H05K *5/02*
U.S. Cl. 181—147 **18 Claims**



1. A loudspeaker for a stereophonic loudspeaker system for producing acoustical output over a range of frequencies comprising a casing forming an acoustical enclosure having a frontal wall, a side wall, a top wall, a substantially vertical rear wall, and a substantially horizontal bottom wall, a first loudspeaker unit arranged in the casing for radiating the lower frequencies of said range located on said side wall near said rear wall, and a second loudspeaker unit arranged near the rearmost part of said top wall for radiating the higher frequencies of said range and being oriented with its axis of radiation directed slantwise forwards to intersect an imaginary plane flush with said side wall characterized in that said first loudspeaker unit is disposed adjacent to said bottom wall and at a substantial distance from said frontal wall.

4,558,763

MUFFLER FOR A PNEUMATIC HAMMER

Roger Montabert, Bron, France, assignor to Montabert S.A., Saint-Priest, France

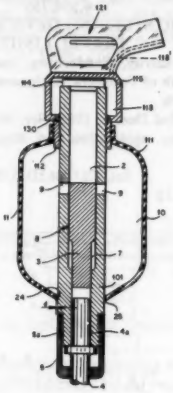
Filed May 21, 1980, Ser. No. 152,034
Claims priority, application France, May 22, 1979, 79 13912
Int. Cl.[4] B23B *45/04;* **B25D** *1/20, 1/22*
U.S. Cl. 181—230 **10 Claims**

1. In a low-noise pneumatic hammer comprising a cylinder body having a ram pneumatically reciprocatable in a cylinder bore thereof and provided with at least one orifice for venting compartments of said bore into an annular storage chamber surrounding said cylinder body and defined between a shell surrounding said cylinder body and the cylinder body itself, the chamber and said shell having opposite axial ends, the improvement which comprises:

an annular edge formed on said shell at one of said axial ends and spacedly juxtaposed with the exterior of said cylinder body to define therewith an annular clearance forming a passage for venting said chamber into the atmosphere, said one of said axial ends of said shell being turned inwardly to approach said body and form said clearance;

a sleeve slidable on said body at said end of said shell opposite said one of said axial ends and connected with said shell whereby said sleeve and said shell form an assembly; and

means for elastic suspension between said sleeve and said cylinder body whereby reaction forces on said cylinder body and inertia of said assembly induce relative movement of said edge and said body to maintain said passage clear of obstruction during use of said hammer.

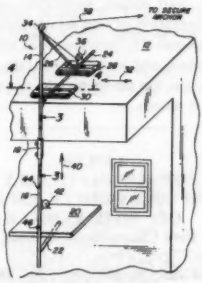


4,558,764

SCAFFOLDING SYSTEM

Robert A. Lorenz, 1730 Elmdale Ave., Glenview, Ill. 60025

Filed Oct. 15, 1984, Ser. No. 661,129
Int. Cl.[4] E04G *3/12, 3/10*
U.S. Cl. 182—45 **7 Claims**



1. A scaffolding system for use on a roof, comprising:

a lower mast section, an upper mast section, and a sleeve selectively interconnecting said upper and lower mast sections in a coaxial arrangement;

a platform laterally supported by the lower mast section;

a support arm laterally projecting from the upper mast section;

a pair of roller members;

coupling means respectively on said lower mast section and on said support arm for selectively coupling to said pair of roller members;

a first winch means coupled to the lower mast section for controlling a first cable extendable parallel to said lower mast section, and a second winch means coupled to the support arm for controlling a second cable extendable perpendicular to the upper mast section, whereby with said roller members coupled to said lower mast section,

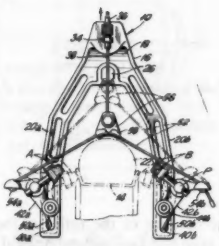
said scaffolding system can be utilized on a gabled roof with the end of the first cable extending over the top ridge of the roof and anchored on the other side of the roof and said first winch means controlling the movement up and down along the gabled roof, and with said roller members coupled to said support arm and said lower and upper mast sections interconnected, said scaffolding system can be utilized on a flat roof with the end of the second cable extending along the flat roof and anchored at a remote location and said second winch means controlling the movement across the flat roof.

4,558,765

BRAKE ASSEMBLY FOR BICYCLE

Thomas B. Hogan, 9 Seven Oaks La., Brewster, N.Y. 10509

Filed Oct. 13, 1983, Ser. No. 541,691
Int. Cl.⁴ B62L *1/14*
U.S. Cl. 188—24.19 **7 Claims**



1. A brake assembly for braking a wheel mounted on a frame body for rotation relative to the frame body in a forward rotational direction, the frame body including a pair of tubular members each extending generally radially of the wheel and on a different side of the plane of wheel rotation, the assembly comprising:

a generally U-shaped bracket member including a base portion and a pair of spaced apart legs;

means for fixing said bracket member to the frame body so that at least a portion of each of said legs is flush against a different one of the tubular members of the frame body;

a pair of cantilever brake pad devices each adapted to be mounted at a desired longitudinal position within a certain adjustment range on a different one of said legs of said bracket member, for pivotable movement about an axis substantially perpendicular to the plane of said bracket member, wherein reaction forces transmitted through said brake pad devices to each of said legs of said bracket member are applied by said legs over portions of the tubular members of the frame body when said brake pad devices frictionally contact the forward rotating wheel;

means for mountinig each of said brake pad devices at said desired longitudinal position within said certain adjustment range on said legs of said bracket member, said adjustment range extending in a genereally radial direction relative to the wheel when said bracket member is fixed to the frame body; and

actuating means for pivoting said brake pad devices toward a braking position to frictionally contact the wheel, said actuating including anchoring means fixed at said base portion of said bracket member for fixing the position of an end of a sheathing of a sheathed actuating cable relative to said bracket member, a linking cable coupled to said pair of brake pad devices for pivoting said devices toward said braking position, and coupling means for transmitting an operating force to said linking cable in response to pulling movement of an actuating cable extending from said anchoring means;

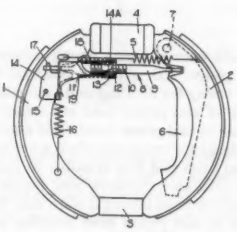
wherein said anchoring means is positioned on said bracket member relative to said brake pad devices so that said linking cable transmits a pivoting force to said brake pad devices in a plane substantially perpendicular to the pivot axes of said brake pad devices when said coupling means is pulled by the actuating cable.

4,558,766

AUTOMATIC ADJUSTER FOR A SHOE DRUM BRAKE

Christopher W. Palmer, Birmingham, and Ronald M. Hughes, West Midlands, both of England, assignors to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 325,643, Nov. 30, 1981, Pat. No. 4,476,963. This application Mar. 30, 1984, Ser. No. 595,451
Claims priority, application United Kingdom, Dec. 6, 1980, 8039220; Jun. 4, 1981, 8117121
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.⁴ F16D *65/40*
U.S. Cl. 188—79.5 B **10 Claims**



1. An automatic adjuster for a shoe drum brake comprising an automatically variable length strut operatively disposed between the brake shoes to maintain in use, in response to wear of the brake shoe linings, a predetermined maximum shoe to drum clearance, and a thermally responsive body of shape memory effect material operatively associated with said strut to produce, at least during brake actuation, in response to an increase in temperature of the brake, an increase in the length of said strut and thereby cause outward movement of the shoes to compensate, at least in part, for drum expansion, and means operatively associated with said strut to cause said strut to transmit compressive loads applied thereto independently of said thermally responsive body.

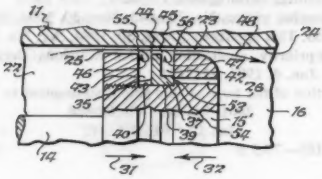
10. An automatic adjuster for a shoe drum brake comprising: a variable length strut operatively disposed between the brake shoes comprised of two telescoping members; an external screw thread on one of said telescoping members which is insertable into the other telescoping member; an internally threaded abutment member threadedly engaging said external screw thread and engageable in abutting relationship with said other telescoping member to adjust the length of said strut by rotation of said abutment member; a cylindrical ratchet on the outer surface of said abutment member; a lever pivotally mounted at one end thereof on one brake shoe; a pawl on the other end of said lever operatively continuously engaging said ratchet to rotate said abutment means when said lever is pivoted to automatically vary the length of the strut to maintain in use, in response to wear of brake linings on the brake shoes, a predetermined maximum shoe to drum clearance; a spring member mounted on said one brake shoe and operatively engaging said lever to resiliently urge said pawl on the lever into engagement with said ratchet; and shape memory effect material incorporated in said spring member so that, at least during brake actuation, when subjected to excessively high temperatures said spring member is effectively prevented from causing said lever to rotate said abutment member to thereby prevent said abutment means from varying the length of the strut during such time as the spring member is subject to said high temperature.

4,558,767

FLUID AMPLIFIED SHOCK ABSORBER WITH REBOUND STIFFENING CONSTRUCTION

Douglas P. Taylor, North Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,404
Int. Cl.⁴ F16F 9/50
U.S. Cl. 188—282 **6 Claims**



1. A shock absorber having a casing, compressible fluid in said casing, a piston rod, a piston head on said piston rod located in said casing for dividing said casing into a first chamber on one side of said piston head and a second chamber on the opposite side of said piston head, fluid amplification means on said piston head for producing fluid amplified flow around said piston head from said first chamber to said second chamber through a clearance between said piston head and said casing as said piston head moves toward said first chamber, an annular groove in said piston head dividing said piston head into a plurality of parts of substantially equal diameter, first opposite sides on said annular groove, first outer edge portions of said first opposite sides of said annular groove, turbulence inducing means in said annular groove, said turbulence inducing means comprising an annular member in said annular groove, second opposite sides on said annular member facing said first opposite sides, each of said second opposite sides terminating at a second outer edge portion on said annular member, and mounting means mounting said annular member in a passive position proximate the first side of said annular groove closest to said second chamber wherein it permits fluid amplified flow as said piston head moves toward said first chamber, said mounting means permitting said annular member to move to an active turbulence inducing position wherein it divides said annular groove into a plurality of annular grooves to retard flow from said second chamber to said first chamber as said piston head moves toward said second chamber by causing said first and second outer edge portions to create turbulence as said compressible fluid flows through said clearance space from said second chamber toward said first chamber, and means for retaining said annular member in said active turbulence inducing position as said piston head moves toward said second chamber.

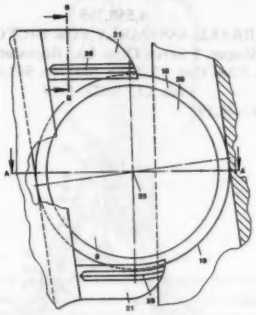
4,558,768

EXPANDING WEDGE ACTUATION DEVICE

Manfred Brandenstein, Eussenheim; Roland Haas, Lendershausen, and Rudiger Hans, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF Kugelagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,376
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215904
Int. Cl.⁴ F16D 65/22
U.S. Cl. 188—343 **9 Claims**

1. A wedge assembly particularly adapted for expanding brakes of motor vehicles including a housing and at least a pair of push rods movably supported in the housing and operatively connected to brake shoes of the brake, the push rods having confronting oppositely inclined faces comprising a wedge member having a pair of oppositely inclined wedge faces complementing the inclined faces of the push rods and at least a roller engaging between the inclined faces of said wedge member and push rods, and a cage for guiding said rollers slidingly movable in a longitudinal direction on said expansion wedge member, said cage having two rigid flank portions (**14**) integral and common to the rollers and extending parallel to the transverse direction having two free flank ends reciprocally directed in the transverse direction and provided with guide means for the rollers, each of said rollers having smooth axial end faces blending at their circumferential edge into a rolling face and said guide means being formed by two radial guide sections (**21**) disposed opposite each other in longitudinal direction (**13**), and each radial guide section (**21**) conforming



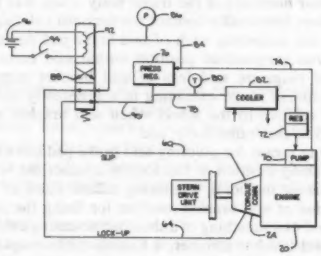
generally to the contour of the roller at the peripheral edge juncture of the axial end face and cylindrical rolling surface to define an edge face gripping the outer edge of the roller, said edge face extending beyond the length of the roller displacement in a transverse direction to provide a self-locking unit comprising the wedge, rollers and cage, and an axial guide section (**22**) on each flank end (**15**) of the roller cage (**12**) slidingly engaging the area of the related front face (**20**) of the roller (**8**) adjacent to the wedge face (**6**) of the expanding wedge member (**3**), said guide means permitting movement of said rollers related to the cage in a transverse direction.

4,558,769

MARINE DRIVE HAVING SPEED CONTROLLED LOCK-UP TORQUE CONVERTER

Gerald F. Neisen, Oshkosh, Wis., assignor to Brunswick Corp., Skokie, Ill.

Filed Dec. 23, 1982, Ser. No. 452,764
Int. Cl.⁴ B60K 41/02
U.S. Cl. 192—3.31 **2 Claims**



1. In a marine drive for a boat, said marine driving having an engine and a propulsion unit, the improvement comprising:

a torque converter interposed in the marine drive between the engine and propulsion unit, said torque converter having a torque magnifying fluid coupling between an input shaft coupled to the engine and an output shaft

coupled to the propulsion unit, said torque converter being capable of assuming a slip condition in which said input and output shafts are coupled through said fluid coupling and a lock-up condition in which said input and output shafts are directly and mechanically coupled together; and

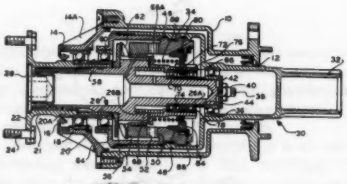
control means coupled to said torque converter for operating said torque converter between said slip condition and said lock-up condition; said control means being responsive to the speed of the engine for operating said torque converter into the slip condition when engine speed is below a first predetermined value but above a second predetermined value, lower than said first predetermined value, thereby to provide improved acceleration characteristics to the marine drive; said control means operating said torque converter into the lock-up condition at other engine speeds.

4,558,770

FREEWHEEL UNIT

Frank Woodruff, New Hartford, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 9, 1983, Ser. No. 492,866
Int. Cl.⁴ F16D *47/04*
U.S. Cl. 192—48.6 **7 Claims**



1. A unit for transmitting a driving torque from an input to an output shaft in a given rotational sense, load torque of the same rotational sense at the output shaft being operable to cause it to freewheel, comprising:

(a) a rotor arranged to be driven by said input shaft, the rotor including a member having a plurality of internal spiralled splines;

(b) a hub coupled to said output shaft to rotate therewith;

(c) a thrust means threadably and coaxially mounted on said rotor for running on said rotor and engaging said hub, said thrust means having complementary external splines engaging said internal splines;

(d) a unidirectional torque coupler;

(e) drag means coupled between said hub and said thrust means for transmitting torque to the latter in a rotational sense which is opposite to said given rotational sense, said drag means including frictional means serially connected with said unidirectional torque coupler for frictionally engaging said thrust means, the drag means being in engagement with an annulus coaxially mounted within said rotor, said annulus having a plurality of axially extending driving teeth for positively engaging and driving said hub; and

(f) means for urging apart said thrust means and said hub so that, when torque is applied in a given direction through said members, the unidirectional torque coupler resists rotation of said annulus to cause the annulus to telescope and engage said output shaft, and when the load torque at said output shaft reverses from said direction, the unidirectional torque coupler ceases the resistance to rotation of said annulus, and the means for urging apart urges said annulus to disengage said output shaft.

4,558,771

CLUTCH COVER ASSEMBLY

Dominique Després, Clichy, France, assignor to Valeo, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,376
Claims priority, application France, Dec. 16, 1982, 82 21097
Int. Cl.⁴ F16D *13/44*
U.S. Cl. 192—70.18 **15 Claims**

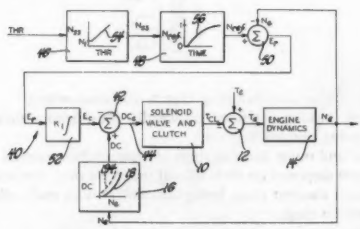
1. A clutch cover assembly comprising a combination of at least three components adapted to be pre-assembled prior to utilization, said combination incorporating a cover which is fixed in the axial direction, a plate which is movable in the axial direction and elastic means operatively disposed between said cover and said plate, said clutch cover assembly further comprising at least one peg adapted to limit movement of said plate and comprising at least one snap-action fastener adapted to immobilize it in the axial direction relative to a first of said components and a head incorporating a barrel and a retaining shoulder, a second of said components having a retaining edge and said barrel being radially spaced from said retaining edge so as to permit, in normal operation of said assembly, relative sliding movement of said barrel and said edge, and said shoulder being adapted for engagement with said edge in an abutting relationship when said assembly is in a storage configuration.

4,558,772

ELECTRONIC CONTROL FOR A STARTING CLUTCH

Michael R. Grimes, and William J. Vukovich, both of Ypsilanti, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1984, Ser. No. 645,338
Int. Cl.⁴ B60K *41/02*
U.S. Cl. 192—0.076 **3 Claims**



1. For a motor vehicle including a fluid-operated clutch for transmitting torque from the engine to the transmission wherein the speed of the engine during engagement of the clutch for a given setting of the engine throttle is determined by the torque capacity of the clutch which in turn is deter-

mined by the energization duty cycle of an electrically operated actuator, the combination comprising:

principal clutch control means responsive to the speed of the engine for defining a principal energization duty cycle value as a function of engine speed; and

vernier clutch control means responsive to the difference between the actual engine speed and a reference engine speed for developing a vernier energization duty cycle value which is combined with the principal energization duty cycle value and applied to said actuator thereby to compensate the applied duty cycle value for variations in the actual engine speed due to performance variations in the actuator and other components of the system, the vernier clutch control means including means for integrating the difference between the actual engine speed and the reference engine speed to form the vernier duty cycle value thereby to minimize the steady state value of such difference, means responsive to the engine throttle setting to define a steady state reference engine speed value at which it is desired to maintain the actual engine speed relatively constant during engagement of said clutch, and means responsive to changes in the steady state reference engine speed value during engagement of the clutch to effect the required changes in value as a function of time in accordance with a dynamic response characteristic that generally approximates the dynamic response characteristic of the engine thereby to stabilize the engine speed response during engagement of the clutch.

4,558,773

VIBRATION DAMPING CLUTCH DISC

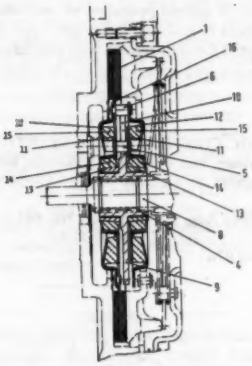
Georg Schäfer, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,009

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004242

Int. Cl.[4] F16D *3/68*

U.S. Cl. 192—106.1 **2 Claims**



1. In a vibration damping clutch disc comprising:

a hub, having extended outwardly therefrom a drive disc having cutouts therein;

inner and outer damper rings of elastomeric material one of each disposed on each side of the drive disc, the inner and outer damper rings being concentric with each other;

a friction ring;

an intermediate ring on each side of said disc;

support rings on each side of said disc;

first means connecting said support rings to each other with a spacing and to said friction ring; and

said first means and means associated with said intermediate rings engaging in the cutouts of the drive disc, the cutouts comprising end stops on both sides to limit rotational mobility of the intermediate rings and the support rings relative to the drive disc, the improvement comprising:

the intermediate rings having angular cross-sections with legs extending radially outwardly;

second means rigidly connecting said legs of the intermediate rings to each other with a spacing said second means being the means associated with said intermediate rings engaging in the cutouts; and

the support rings including portions extending substantially radially inwardly and axially outwardly spaced from said legs, the outer damping rings being located between said outwardly extending legs of said intermediate rings and the inwardly extending portions of said support rings.

4,558,774

METHOD AND APPARATUS FOR COLLECTING WEIGHED ARTICLES DISCHARGED FROM COMBINATORIAL WEIGHING SYSTEM

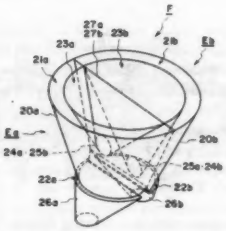
Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Aug. 12, 1983, Ser. No. 522,564

Claims priority, application Japan, Aug. 12, 1982, 57-140815

Int. Cl.[4] B65G *11/00*; G01G *19/32*

U.S. Cl. 193—2 R **3 Claims**



1. An apparatus for collecting articles, comprising:

a first compound chute including

a first outer chute having an upper opening and a discharge opening,

a first inner chute, said inner chute being disposed within said outer chute and

a first partitioning plate having a first through hole in communication with said first outer chute and a second through hole in communication with said first inner chute;

a second compound chute including

a second outer chute having an upper opening and a discharge opening,

a second inner chute, said inner chute being disposed within said outer chute, and

a second partitioning plate having a third through-hole in communication with said second outer chute and a fourth through-hole in communication with said second inner chute, said first compound chute and said second compound chute being connected so that said first through-hole and said fourth through-hole are in communication and said second through-hole and said third through-hole are in communication;

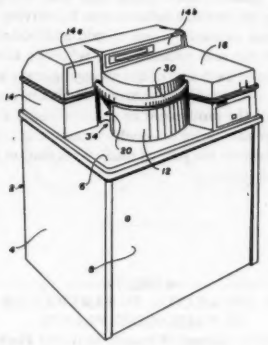
a first discharge chute having an upper opening in communication with said discharge opening of said first outer chute; and

a second discharge chute having an upper opening in communication with said discharge opening of said second outer chute.

4,558,775
APPARATUS FOR PASSIVE ANALYSIS OF CONTAINERS TO DETERMINE ACCEPTABILITY FOR RECYCLING

Robert L. LaBarge, Ben Avon; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Frank J. Horansky, Apollo; Charles J. Leftault, Jr., Murrysville, both of Pa.; Elmer E. Pohlenz, Richmond, Ind., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,423
Int. Cl.⁴ G07F 7/06
U.S. Cl. 194—4 C **3 Claims**



1. Apparatus for the receipt of recyclable containers, said apparatus being characterized by the analysis and initial acceptance or rejection of a container for recycling without mechanical movement apparent to the user which comprises:

(a) a manually operated rotatable carrier;

(b) a container receiving station associated with said carrier;

(c) detecting means coupled to said receiving station to determine the presence of a metallic container acceptable to said apparatus including early presence detection wherein the detection of the presence of metal in said receiving station prior to the rotation of said receiving station into a position permitting insertion provides a signal to said apparatus that the metal being detected is not metal which has followed the proper insertion sequence; and

(d) means for subsequently permitting manual actuation of said rotatable carrier if said container comprises a material acceptable to said apparatus.

4,558,776
APPARATUS FOR ARRANGING CROSS-WOUND PACKAGES ON AN AUXILIARY TRANSPORT BELT

André Lattion, Seuzach, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jul. 5, 1983, Ser. No. 510,557
Claims priority, application Switzerland, Jul. 20, 1982, 4409/82
Int. Cl.⁴ B65G 47/30, 43/08
U.S. Cl. 198—429 **12 Claims**

1. An apparatus for removing cross-wound packages having a predetermined bobbin length from a spinning machine, and comprising:

a main transport belt extending substantially lengthwise of the spinning machine for receiving cross-wound packages therefrom and serving to deliver said cross-wound packages to one end of a transport path defined by said main transport belt;

each of said cross-wound packages having a lengthwise axis extending substantially parallel to their direction of movement during transport upon said main transport belt;

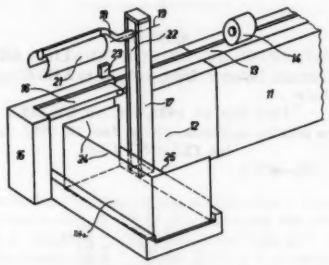
an auxiliary transport belt positioned substantially in alignment with said main transport belt and defining a transport path having a starting end adjoining said one end of said transport path of said main transport belt;

means for limiting to an acceptable minimum, during the removal of said cross-wound packages from said spinning machine, any relative sliding movement between said auxiliary transport belt and said cross-wound packages;

said limiting means comprising detector means for controlling the movement of said auxiliary transport belt;

said detector means being arranged at a region where said transport path of said auxiliary transport belt neighbors said transport path of said main transport belt;

said detector means being activated by said cross-wound



packages on said transport belts in order to initiate movement of said auxiliary transport belt whenever one of said cross-wound packages passes said detector means;

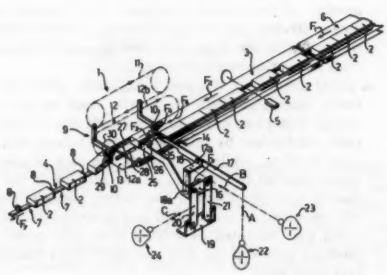
said limiting means further comprising stopping means for stopping said auxiliary transport belt after movement of the same through a distance at least approximately equal to the bobbin length of said cross-wound packages such that a successive arrangement of a closely spaced predetermined number of said cross-wound packages can be formed on said auxiliary transport belt; and

said limiting means still further comprising removal means for removing in substantially frictionless manner at least one of said cross-wound packages from said auxiliary transport belt.

4,558,777
DEVICE FOR TRANSFERRING BISCUITS AND CONFECTIONERY PRODUCTS IN GENERAL

Renzo Francioni, Grignasco, Italy, assignor to Cavanna S.p.A., Prato Sesia, Italy

Filed Sep. 10, 1982, Ser. No. 416,597
Claims priority, application Italy, Dec. 11, 1981, 25530 A/81
Int. Cl.⁴ B65G 47/31
U.S. Cl. 198—461 **7 Claims**



1. A device for transferring biscuits and confectionery prod-

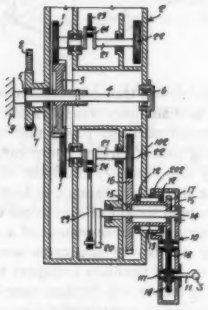
ucts from a first continuous belt conveyor to a second in-line compartmented belt conveyor, said device comprising a bladed chain conveyor having an active pass extending in the same direction as the continuous belt above at least an end section thereof laterally of said products, pusher means having an element movable reciprocatingly in the direction of the continuous belt and a pusher mounted on said element for movement transverse to the continuous belt in a rectangular cycle for displacing one said product at a time diagonally towards said active pass of the bladed chain conveyor; and a cam located in correspondence with the end of said active pass of the bladed chain conveyor, said cam being rotatable in synchronism with the blades of said blade conveyor to strike each product from above to aid in the removal of the product from the blade.

4,558,778

TRANSFERRING DEVICE FOR ROD-LIKE ARTICLES

Athos Cristiani, Bologna, Italy, assignor to SASIB S.p.A., Bologna, Italy

Filed Jun. 14, 1983, Ser. No. 504,151
Claims priority, application Italy, Jun. 23, 1982, 12573 A/82
Int. Cl.[4] B65G *47/86*
U.S. Cl. 198—471.1 **2 Claims**



1. A cyclic, sequentially transferring device for gradually turning a moving file of axially aligned rod-like articles located at a pick-up station into a uniform row of said articles arranged parallel to each other at a delivery station having a rotating drum, the drum having an axis that is substantially parallel to the axes of the articles at the pick up station, comprising:

a rotary carrier positively driven at a constant speed;

a number of swinging arms movably mounted on said carrier in a star-like arrangement at equal distances therebetween;

a plurality of mandrels, each mandrel being rotatably mounted on a respective swinging arm;

a suction head carried by each arm for picking up and transferring the articles, each suction head being mounted on a respective mandrel and having an axis;

a number of correlated, positively reciprocating separate means driving each a respective one of the swinging arms by oscillating the respective swinging arm back and forth with respect to said carrier; and

an equal number of like epicyclic trains which are operatively associated with the carrier itself so as to evenly entrain every one of the suction heads into motion along a path, established by said carrier as it rotates and arms as they oscillate, while maintaining the axes of said suction heads parallel to the axes of the articles at the pick-up station, said epicyclic trains including planet pinions rotatably mounted on said carrier and arranged in a circle, and a sun gear mounted on a fixed shaft, said planet pinions meshing with said sun gear and said carrier rotating about said fixed shaft,

wherein each epicyclic train further includes an additional shaft rotatably mounted on said carrier, one of said planet pinions being mounted onto said additional shaft, a gear train with a unitary gear ratio, said gear train including three position-repeating gears, one of which is connected to a mandrel, and a transmission gearing through which the gear train is linked to said additional shaft, said transmission gearing having a pair of unitary regression gears with a ratio equal and contrary to that of the planet pinion with respect to the sun gear, whereby each suction head is driven, independently from the oscillatory movement of its own swinging arm, and

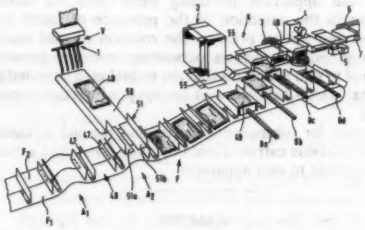
wherein each one of the said positively reciprocating means driving each a respective one of the swinging arms includes a spindle onto which that one swinging arm is swingably mounted, a balance arm for driving the spindle, and a crank carried by one of said additional shafts, said crank driving said balance arm, whereby the oscillatory movement of each one of the swinging arms will be cyclically and operatively synchronized also in amplitude and phase with the movement of the associated suction head, the said spindle being co-axially mounted in a tubular shaft which connects the pair of unitary regression gear wheels to the gear train.

4,558,779

CONVEYOR APPARATUS, IN PARTICULAR FOR USE IN PACKAGING PLANTS

Reinhold Schmitt, Giessen-Wieseck; Manfred Herbert, Biebertal, and Walter Baur, Gruendau, all of Fed. Rep. of Germany, assignors to Rovema Verpackungsmaschinen GmbH, Fernwald, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,219
Claims priority, application European Pat. Off., Oct. 13, 1982, 82109442.2
Int. Cl.[4] B65G *15/14*
U.S. Cl. 198—627 **26 Claims**



23. A conveyor apparatus, comprising elongate, longitudinally movable first and second conveyor belts which are parallel and adjacent each other and which each have a support surface thereon, said support surface being substantially flush, each of said conveyor belts further having a plurality of compartment walls secured thereon at spaced locations therealong and projecting outwardly from said support surface thereon, each said compartment wall on each said conveyor belt having a portion which extends laterally over the support surface on the other of said conveyor belts, and each said compartment wall on said first conveyor belt being associated with a respective said compartment wall on said second conveyor belt and defining a compartment therebetween, and including drive means for selectively effecting relative longitudinal movement and synchronous longitudinal movement of said first and second conveyor belts, said relative movement of said conveyor belts effecting an adjustment of the distance between each said compartment wall on said first conveyor belt and the compartment wall on said second conveyor belt associated therewith.

4,558,780

CONVEYER APPARATUS

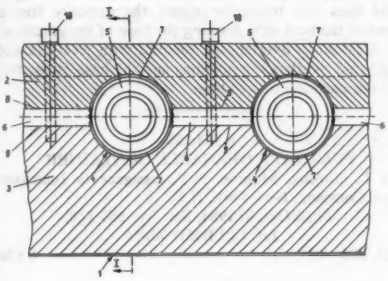
Volker Burkhardt, Lerchenstrasse 29, 7085 Bopfingen, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 554,004

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248597

Int. Cl.[4] B65G *13/02*

U.S. Cl. 198—780 2 Claims



1. An apparatus for transporting material comprising first and second longitudinally extending, spaced conveyor supports, the first of which comprises upper and lower sections divided along a horizontal plane; a plurality of conveyor assemblies extending between said conveyor supports each of which comprises a roller shaft having a large diameter conveyor roller afixed between its ends and a roller shaft bearing afixed adjacent each of its ends, each of said conveyor assemblies being adapted to rotate and to be inserted and removed from said apparatus as a unit; circular bearing recesses in each conveyor support for receiving the roller shaft bearings of each conveyor assembly, each circular bearing recess in said first conveyor support being formed by cooperating semi-circular recesses in each of said upper and lower sections thereof; longitudinal semi-grooves in the divided surface of each of said upper and lower sections of said first conveyor support extending between and communicating with each semi-circular recess, said semi-grooves forming full grooves adapted to receive retaining members when said upper and lower sections are brought together; a recess in the circumference of each roller shaft bearing received in each of the bearing recesses of said first conveyor support adapted to receive one end of a retaining member, each adjacent pair of bearing recesses receiving an opposite end of the retaining member when received by the full groove, whereby lateral movement of said roller shaft is minimized; and a vertical bore extending through said upper section and into said lower section between each bearing recess of said first conveyor support adapted to receive securing means, whereby said upper and lower sections can be brought together by the insertion of said securing means into said bore thereby permitting said bearing recesses to receive and support said roller shaft bearings, and can be separated by the withdrawal of said securing means thereby permitting the removal of said roller shaft bearings from said bearing recesses and said conveyor assemblies from the apparatus.

4,558,781

CARTRIDGE FOR USE IN ANCHOR BOLTING

John M. Murphy, Mansfield; Robert H. Spensley, Swanwick, and John Ellis, Sutton in Ashfield, all of Great Britain, assignors to Societe Anonyme d'Explosifs et de Produits Chimiques, Paris, France

Filed Jun. 25, 1981, Ser. No. 277,344

Claims priority, application United Kingdom, Jul. 23, 1980, 8024032

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 10 Claims

1. An anchoring cartridge for use in anchoring a reinforcing or fixing element in a borehole in a substrate, the cartridge comprising a frangible casing formed from an inert, liquid-impermeable material, the casing containing a particulate liquid-settable solid component in contact with a substantially longitudinally extending absorbent material at least one end portion of which communicates with, or is adapted to communicate with, the exterior of the cartridge, whereby when the cartridge, or at least said one end portion of the cartridge, is immersed in an activating liquid component capable of reacting with the solid component so as to cause it to set, the activating liquid component is drawn into the cartridge by the absorbent material disposed within the liquid-impermeable casing and is enabled to come into contact with the solid component over substantially its whole length within the casing.

4,558,782

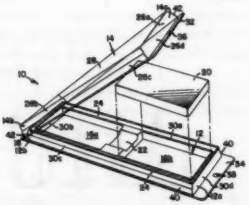
POINT OF SALES PACKAGE FOR CASSETTE TAPE CARTRIDGES

Peter B. Iverson, Plymouth, and John A. Gambell, Burnsville, both of Minn., assignors to Imperial Plastics, Inc., Lakeville, Minn.

Filed Feb. 7, 1983, Ser. No. 464,468

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 1 Claim



1. A plastic point of sale package for a standard cassette tape cartridge comprising a cover and a base. The cover and the base both being composed of a heat deformed sheet of extrusion grade polyvinyl chloride, the sheet having a thickness in the range of 10–20 mils, the base having two recessed coplanar cavities, the cavities being compatibly dimensioned so as to securely house a standard cassette tape cartridge, the cavities being interconnected by a recessed bridge, the recessed bridge

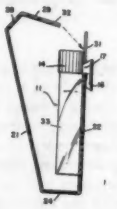
being integrally formed within the base member so as to provide stiffness to the base member, the base member further including a single, continuous, peripheral, radiused, recessed channel surrounding the perimeter of the base member so as to stiffen the base member, the base member also having sidewalls as terraced shoulders, the shoulders providing increased rigidity to the base member, the cover of the package being compatibly shaped so as to cooperatively mate with the base, thereby sealing the cassette tape cartridge within the cavity, the cover and base being permanently attached together by means of an integrally formed hinge so as to permit opening and closing the package.

4,558,783

FOLDER FOR SAMPLER PERFUME VIAL

Danny E. Dangerfield, Boones Mill, Va., and James A. Purvis, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 23, 1984, Ser. No. 633,738
Int. Cl.⁴ B65D *23/00*
U.S. Cl. 206—472 **5 Claims**



1. In combination with a vial having an elongated protuberance extending from the vial in spaced relationship, a folder formed from flexible sheet material and comprising

a front panel connected at a bottom edge to a back panel,

said front panel connected at a top edge to a top end panel having a retaining section with a cutout extending to its distal edge,

said back panel having a cutout extending to its distal edge,

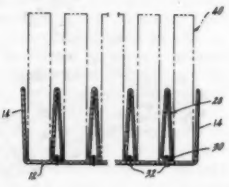
said folder being folded to position said front and back panels on opposite sides of said vial and said cutouts in gripping relationship with said protuberance.

4,558,784

CORRUGATED STRIP TRAY

Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Jul. 23, 1984, Ser. No. 633,480
Int. Cl.⁴ B65D *6/00*
U.S. Cl. 206—561 **1 Claim**



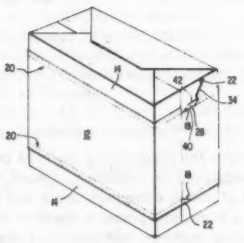
1. A tray for use in a machine for assembling heat exchanger cores wherein a plurality of corrugated metal fin strips are placed in interdigital relation with a plurality of coolant tubes which are retained in uniformly laterally spaced parallel relation, said tray comprising a base plate having a length to accommodate the strips in lengthwise fashion and a width to accommodate a plurality of the strips in a laterally spaced relation, a plurality of laterally spaced partitions extending lengthwise of said base and forming a plurality of successive channels in which the strips are adapted to be arranged lengthwise, means adjacent one end of the base plate forming an end wall against which one end of the strips are adapted to abut, and means at the opposite end of the base plate forming a plurality of laterally spaced fingers adapted to engage between the laterally successive coolant tubes so as to align said channels with the spaces between the successive tubes so that, when the tray is inclined to a predetermined extent and displaced axially along said tubes, the strips are deposited in an interdigital relation with the tubes, each partition having opposite side walls which extend longitudinally of the base and which slope away from each other in a downward direction so that the channels are narrower at the base than at the top thereof, each partition comprising a metal strip bent lengthwise along three parallel lines into triangular shape, the opposite free edge portions of the bent strip forming the base of the partition and being disposed in overlapping relation with rivets extending through said overlapping portions and the base of the tray to secure the partition to said base.

4,558,785

TEAR TAPE OPENABLE CONTAINER

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,110
Int. Cl.⁴ B65D *75/66*
U.S. Cl. 206—617 **6 Claims**



1. A severable wall construction for a closed container having walls, the walls formed of a sheet of foldable, tearable material, such as paper or paperboard, the container having an upper and a lower portion normally integrally joined, the upper container portion having a lower edge and the lower container portion having an upper edge, a border zone circumferentially around the container and forming a boundary between upper and lower container portions, the border zone defined by a partial overlapping between the lower edge of the upper container portion and the upper edge of the lower container portion, the sheet material at the border zone being Z-shaped in a cross-section taken at right angles to the border zone, the Z having an outer leg defined by one of the partially overlapped edges, and having an inner leg defined by the other of the partially overlapped edges, the inner leg being substantially parallel to the outer leg, a filament tear tape positioned between and sandwiched by one of the outer legs and the middle leg of the Z and co-extensive along the border zone, means externally of the container for manually grasping an end of the tear tape, whereby when that filament tape end is grasped and pulled, along the length of the border zone, the junction between the tear tape sandwiching one outer leg and the middle leg of the Z is severed and thereby separates the upper from the lower container portion, and whereby the middle and the other, non-severed outer leg of the Z forms a hem of two layers of the sheet material around one edge of one of the separated container portions, the middle leg of the Z forming the outer layer of the hem, whereby the junction of the middle and non-severed outer legs of the Z forms the upper

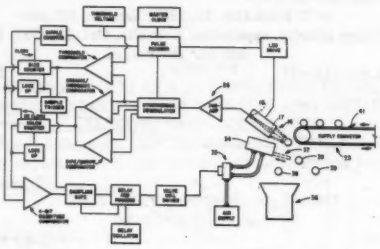
rim of said one of the separated lower container portions, the middle and that leg of the Z which does not sandwich the tear tape being adhered together in intersurface contact, whereby the middle leg of the Z after separation of the upper and lower container portions remains in intersurface engagement with that leg of the Z to thereby form the hem.

4,558,786

ELECTRO-OPTICAL SORTER

Marvin M. Lane, 4714 Eli Ct., Carmichael, Calif. 95608, assignor to Marvin M. Lane, Carmichael, Calif.

Filed Jun. 15, 1983, Ser. No. 504,556
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—558 **6 Claims**



1. An apparatus for sorting inorganic and unripe organic articles from ripe organic articles, comprising:

a. master clock means for producing sequential control pulses;

b. illumination means responsive to said control pulses, for exposing the articles to a sampling cycle, said sampling cycle including sequential pulses of light at four discrete frequencies, said frequencies corresponding to the maximum light reflectivity responses characteristic of the inorganic, organic, ripe, and unripe articles;

c. detector means directed at the articles for producing sequential electrical signals commensurate in amplitude to the intensity of light pulses reflected from the materials;

d. comparator means for producing enabling output signals if said electrical signals bear a predetermined relationship, said comparator means including: a color comparator adapted to produce an output signal when the electrical signal corresponding to a ripe article exceeds the electrical signal corresponding to an unripe article; an inorganic/organic comparator adapted to produce an output signal when the electrical signal corresponding to an organic article exceeds the electrical signal corresponding to an inorganic article; a threshold comparator responsive to a selectively variable threshold voltage and adapted to produce an output signal when said electrical signal corresponding to an inorganic article exceeds said threshold voltage;

e. synchronization means responsive to said control pulses, for directing the electrical signals from said detector means to respective inputs of said comparator means in synchronization with the production of each of said sequential pulses;

f. logic means responsive to said enabling output signals of said comparator means for producing a reject signal if the article is not both organic and ripe over a predetermined percentage of its sampled surface, said logic means including a size counter enabled by the output of said threshold comparator, and a color counter enabled by the joined outputs of said organic/inorganic comparator and said color comparator, said color counter being clocked at a rate exceeding the clock rate of said size counter so that the ratio between the clock rates will reflect the predetermined percentage, said logic means further including a magnitude comparator adapted to produce a reject signal if the numerical output of said size counter exceeds the numerical output of said color counter; and,

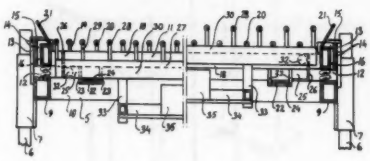
g. means for physically separating inorganic and unripe organic articles from the ripe organic articles in response to the reject signal.

4,558,787

SCREENING DEVICE HAVING A SCREEN DECK COMPOSED OF TWO SCREEN FRAMES

Marcus Danielsson, Hammargatan 6, 820 60 Delsbo; Karl O. Ljunglof, Mejerivagen 10, and Goran Hassel, Skolvagen 3, both of 820 70 Bergsjo, all of Sweden

Filed Aug. 1, 1983, Ser. No. 519,094
Int. Cl.[4] B07B *1/50*
U.S. Cl. 209—626 **6 Claims**



1. A screening device for shifting particulate material, comprising:

(a) a first substantially rectangular-shaped frame (**11**) including a plurality of spaced substantially parallel screening bars (**20**);

(b) a supporting frame (**5**);

(c) first resilient means (**12**) connecting said first frame to said supporting frame;

(d) a second substantially rectangular-shaped frame (**27**) supported on said first frame (**11**) and including a plurality of spaced substantially parallel screening bars (**28**) extending alternately between said screening bars (**20**) of said first frame (**11**) to form together a common screening deck for sifting particulate material of predetermined size;

(e) said second frame (**27**) being provided with supporting members (**29**) extending downwardly between said screening bars (**20**) of said first frame (**11**) and connected to at least two transverse members (**30**) located at a spaced distance beneath said screening bars (**20**) of said first frame (**11**) for maintaining said screening bars (**28**) of said second frame (**27**) in assembled condition;

(f) second resilient means (**24–26, 32**) allowing said second frame (**27**) to rest freely on said first frame (**11**);

(g) vibrator means (**35**) for oscillating said second frame (**27**) relative to said first frame to provide a two-mass oscillatory screening system;

(h) means connected to said transverse members (**30**) for raising said second frame a distance above said first frame to free said common screening deck of entrapped oversized particulate material; and

(i) said raised distance being limited by the movement of said transverse members (**30**) into contact with the said screening bars (**20**) of said first frame (**11**).

4,558,788

EYEGLASS DISPLAY APPARATUS

John F. Grothaus, 2584 Patterson Rd., Pataskala, Ohio 43062

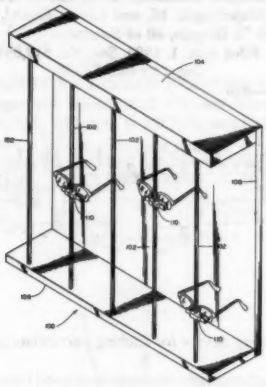
Filed Jun. 29, 1984, Ser. No. 626,493
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **12 Claims**

1. An eyeglass display clip for supporting eyeglasses having two eyepiece rims interconnected by a central bridge and including temples hingedly connected to said rims on a generally vertical support post, said display clip comprising:

a post engaging body section of resilient synthetic plastic

material including a first channel for conformally engaging said support post, said first channel being open on one side for resiliently receiving said post; and

second and third channels integrally formed to said post engaging section and extending therefrom on opposite sides of the opening of said first channel, said second and third channels being substantially aligned with the center of the post engaging portion of said first channel and open in an upward direction when said clip is engaged with said



support post whereby eyeglasses are supported for attractive and compiete visual display by inserting the lower edges of the eyepiece rims into said second and third channels with said temples extending beyond and on either side of said support post such that the bridge of the eyeglasses rests against said support post to maintain the eyeglasses in an attractive simulated in-use display posture with one or both temples fully extended and, hence, clearly in view.

4,558,789

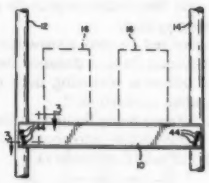
TRANSFORMER RACK SUPPORT BRACKET APPARATUS

Arthur L. Troutner, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.

Filed Jun. 9, 1983, Ser. No. 502,582

Int. Cl.[4] A47F *5/08*

U.S. Cl. 211—107 **17 Claims**



1. Transformer support rack apparatus, comprising:

elongated rack means for supporting electrical transformers above the ground and having a pair spaced opposed mounting arms formed unitarily with and extending longitudinally from each of two opposite ends of the rack means;

two pairs of support bracket means attached to the opposite ends of said rack means for supporting the rack means between a pair of substantially vertical support members, each pair of bracket means including a pair of first and second hanger means for supporting the arms of one pair of mounting arms on opposite sides of one support member; and

adjustable fastening means for fastening the pair of hanger means to the support member and for adjusting the spacing between said first and second hanger means to accommodate support members of different cross-section.

4,558,790

SYSTEM FOR LOAD HANDLING OF AIRCRAFT

Patrick Bruce-Walker, Queanbeyan, Australia, assignor to The Commonwealth of Australia Department of Defense Support, Canberra, Australia

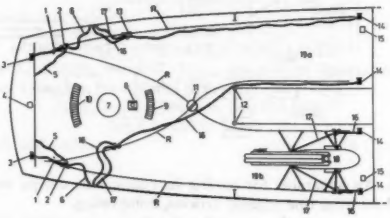
PCT No. PCT/AU82/00172, § 371 Date May 30, 1984, § 102(e) Date May 30, 1984, PCT Pub. No. WO83/01428, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 22, 1982, Ser. No. 515,058

Claims priority, application Australia, Oct. 22, 1981, PF1238

Int. Cl.[4] B64F *1/22*

U.S. Cl. 212—77 **1 Claim**



1. A system for load handling comprising two pairs of spaced winch means, a pair of guide rails extending more or less between said winch means, two pairs of trolley means moveable along said guide rails, and cable means connecting said winch means and said trolley means, wherein each said trolley means has thereon a pulley and a cable fixing point, and said load has thereon a pair of cable fixing points spaced apart, and the cable means form one said winch passes around the pulley on the trolley means closest to itself and passes to a first fixing point on said load, said first fixing point being connected by a set length cable means to the fixing point on the other said trolley means, and said second winch means is likewise connected to the other said trolley means and the second fixing point on said load.

4,558,791

FURNACE DELINING APPARATUS

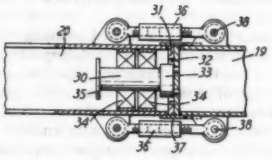
David R. Mosley, Newton Abbot, England, assignor to M.D.S. Furnace Services Limited, Newton Abbot, England

Filed Jan. 10, 1984, Ser. No. 569,755

Claims priority, application United Kingdom, Jan. 26, 1983, 8302170

Int. Cl.[4] E21B *15/04*

U.S. Cl. 212—266 **7 Claims**



1. A furnace delining apparatus comprising a turntable mounted for rotation about a vertical axis, a telescopic jib pivotally connected to the turntable for movement of the jib in

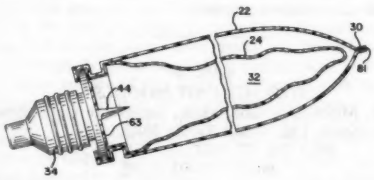
a vertical plane, and a tool mounted at the outer end of the telescopic jib, wherein the jib consists of a first part pivotally connected with the turntable, a second part telescopically mounted on the first part, and a third part forming an extension of the second part and coupled thereto for rotation of said third part about the axis of the jib, said coupling comprising a bearing socket on one part and spigot on the other part engaging said socket, releasable fastening devices connecting said third part to said second part, release of said fastening devices allowing relative movement of said second and third parts along said axis with the spigot remaining within the bearing socket, and locating means which when the fastening devices are re-engaged locate said third part in an angular position about said axis selected by said rotation about said axis.

4,558,792

CONTAINER SUCH AS A NURSING CONTAINER, WITH FLEXIBLE LINER AND ACCESS SITE AND METHOD OF MAKING SAID ACCESS SITE

James L. Cabernoch, Cary, and Leonard A. White, Gurnee, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,412
Int. Cl.[4] A61J *9/04, 9/00*
U.S. Cl. 215—11 R **24 Claims**



1. A nursing container comprising:
a substantially rigid outer shell;
a co-extensive flexible inner liner selectively adhered to said outer shell and separable therefrom;
a nipple access site defined in said shell and liner;
a nipple assembly sealed to said container at said access site;
said access site being defined by a continuous circumferential fold in said shell and liner tightly capturing said liner to prevent inadvertent delamination of said liner outwardly of said fold upon rupture of said access site.

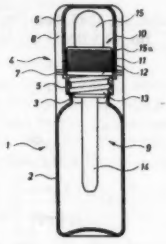
4,558,793

TAMPER EVIDENT CONTAINER

Gerhard Hansen, Heerstrasse 20, 7166 Sulzbach-Laufen 2, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,459
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341334
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—32 **11 Claims**

1. A container, comprising:
a body having an internally threaded portion;
a break-off cap formed as a unitary portion of said body;
a break-off notch between said body and said break-off cap; and
a screw cap having an externally threaded part threadedly engaged with said internally threaded portion, said body being molded about said externally threaded part to form said internally threaded portion, said screw cap being completely surrounded by said break-off cap and said body and having a grip part fixed to said threaded part and



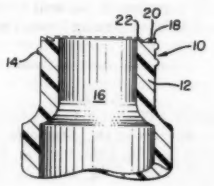
a cylindrical part between said threaded part and said grip part laterally adjacent said break-off notch.

4,558,794

CONTAINER WITH VESSEL FOR RETENTION OF TELLTALES

Edward J. Towns, Morristown, and Edward M. Brown, Livingston, both of N.J., assignors to TBL Development Corporation, Livingston, N.J.

Filed Oct. 19, 1983, Ser. No. 542,191
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—250 **18 Claims**



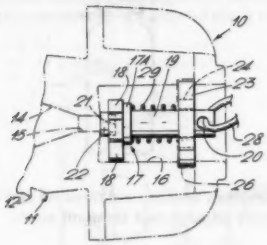
1. A container comprising:
(a) a vessel having a neck terminating in a vessel mouth and defining surface extent circumscribing said mouth and inclusive of vessel sealing surface, said neck having closure member securing means thereon;
(b) a see-through closure member having interior means cooperative with said securing means for movement of said closure member in a first sense for securement to said neck and for closure of said mouth and in second opposite sense for removal of said closure member from said neck; and
(c) telltale means secured to said closure member for activation thereby in the course said closure member second sense movement to provide tamper indication; said vessel surface extent being adapted for engaging said telltale means and having respective first and second different surface configurations to effect first and second different engagements therewith respectively in the course of said first and second sense movements, thereby to permit said telltale means to be moved into closure relation with said sealing surface and to be selectively positively restrained from movement relative to said mouth in at least the initial phase of said second sense closure member movement.

4,558,795

BOTTLE STOPPERS OR CLOSURES

Adrian R. J. Logue, 23 Cherryvalley, Belfast BT5 6PF, Northern Ireland

Filed Apr. 13, 1983, Ser. No. 485,221
Int. Cl.[4] B65D 51/16
U.S. Cl. 215—260 3 Claims



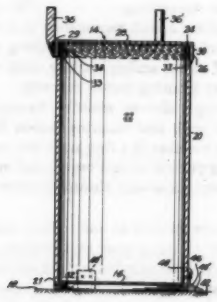
1. A bottle stopper having a head and a stem engageable respectively, over the mouth and against the internal surface of the neck of a bottle when fitted to a bottle wherein the head and the stem have a continuous passage therethrough, the passage having from stem to head, a frusto conical portion feeding into a restriction beyond which is an open-ended chamber, a valve located in said passage and resiliently urged into a closed position to close off said passage but yieldable to open when pressure in the bottle exceeds the resilient pressure, the valve comprising a resiliently-loaded stop, a seat for the resiliently-loaded stop being afforded at the stem-remote side of the restriction, the stop being located in the chamber acting against the seat provided at the outlet of said restriction, the stop having a disc from one side of which axially extends a spindle and in opposite side a recess is provided to locate a seal for urging against the seat, and a retaining cap having an axial aperture through which projects the top of the spindle, the cap being secured in a groove in the wall of the chamber with a resilient-biasing for the stop being located between the disc and cap.

4,558,796

ANIMAL PROOF STORAGE CONTAINER APPARATUS

John R. Jaicks, 40 Harvest Dr., Scarsdale, N.Y. 10583

Filed Sep. 26, 1983, Ser. No. 535,655
Int. Cl.[4] B65F 1/16; B65D 25/28, 41/04
U.S. Cl. 220—1 T 12 Claims



1. An animal proof storage container apparatus comprising, in combination:

a substantially rigid cylindrical container member having a circular bottom wall resting upon a support surface and having an upright generally circular side wall thus defining a substantially enclosed storage compartment, said side wall having a circular top rim portion and externally disposed thread means at an upper edge of said top rim portion,

a substantially rigid lid member having a circular top wall and having a downwardly directed flange; and said lid member having internally disposed thread means on said downwardly directed flange, said lid member thread means container member thread means comprising substantially one complete revolution and being for removably connecting said lid member and said container member in threaded relationship,

gripping means including a plurality of handles extending upwardly from said lid member and being generally peripherally disposed adjacent said flange of said lid member, wherein said handles are circumferentially spaced for providing hand holds for a user in the process of threading or unthreading said lid member onto or from said top rim portion of said container member, said support surface frictionally cooperating with said container member in association with said bottom wall to provide resistance to turning during the threading and unthreading process, and

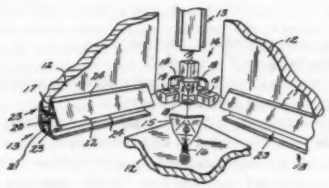
hold down means connected to said outer surface of said container member, enabling a user to employ at least one foot against said hold down means so as to keep said container member stationary against said support surface while said lid member is being screwed onto or from said container member; whereby animals are precluded from separating the threaded relationship of said lid member and said container member.

4,558,797

STORAGE UNIT MODULE

Terry L. Mitchell, Jenison, Mich., assignor to Quest Product Development, Ltd., Grand Rapids, Mich.

Filed Dec. 27, 1983, Ser. No. 565,387
Int. Cl.[4] B65D 33/00
U.S. Cl. 220—84 8 Claims



1. A storage unit module comprising:

a plurality of wall panels having a uniform thickness and sized in height and width to provide space enclosures;

a plurality of uniform cross section extrusions, the cross section forming elongate parallel slots sized to receive edges of said panels selectively at gapped regular angles to each other and in gapped parallel relation and said extrusion including a wraparound flange defining an elongate tubular enclosure on one side and a flat flange on another side of said extrusion in a forty-five degree planar relation to said wraparound flange;

connector elements having extensions mating with said tubular enclosures in the ends of said extrusions and said connectors recessed in plural angle directions, said connector recesses having a width to receive said panels and conceal the corners thereof; and

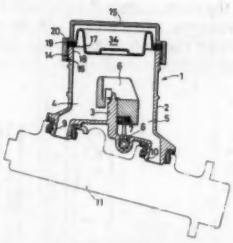
corner tie plates each having a single fastener extendable into said connectors and said plates impinging against all adjacent of said panels whereby upon tensioning said fasteners said storage unit is drawn into a rigid construction.

4,558,798

FLUID RESERVOIR HAVING A SEAL AND COVER

Shozo Sakaguchi, Yoshimi, and Kunio Yanagi, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co. Ltd., Japan

Filed Feb. 22, 1985, Ser. No. 704,644
Claims priority, application Japan, Mar. 2, 1984, 59-30496[U]; Mar. 2, 1984, 59-30497[U]
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—256 3 Claims



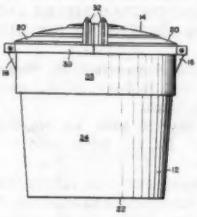
1. A fluid reservoir including a diaphragm for closing hermetically an opening at the top end of the reservoir body of cylindrical shape, a force ring disposed upon the upper surface of the circumferential portion of the diaphragm, and a cap threadedly engaged with the outer circumference of the top end of the reservoir body, so as to have the circumferential edge of the diaphragm secured rigidly in position by using the cap through the force ring, which comprises, in combination, the lower surface of said force ring formed with an annular groove so as to have the circumferential edge of said diaphragm engaged snugly with said annular groove, and a flanged portion defined in the outer circumference of said force ring, said flanged portion being formed with male thread means adapted to threadedly engage with female thread means formed in the inner circumferential surface of said cap in such a manner that said flanged portion of said force ring can be placed to dwell loosely rotatably in the inside of said female thread means.

4,558,799

CONTAINER WITH HINGED LID

Clifton E. Hammond, Elkhorn, Nebr., assignor to Snyder Industries, Inc., Lincoln, Nebr.

Filed Feb. 24, 1983, Ser. No. 469,258
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—343 12 Claims



1. A large molded plastic container comprising:

a plastic container body having a bottom and an upstanding sidewall joined to said bottom, said bottom and said sidewall defining a container interior, and said sidewall having an upper edge defining an opening into said interior;

a plastic lid, having a plurality of cover elements, adapted to overlie said opening;

independent hinge means freely pivotally interconnecting the outer periphery of each of said cover elements to said sidewall so that each of said cover elements is free to pivot independently of the others to an angle no greater than slightly more than 90 degrees;

each of said cover elements extending a sufficient distance from said hinge means so that when closed the distal ends of said cover elements overlap,

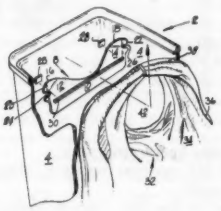
said barrier means for preventing water from entering said container body irrespective of which cover element overlies the other; said barrier means comprising: each cover element having adjacent it's inner edge, an upturned flange, a rib, and a channel located between said upturned flange and rib.

4,558,800

BAG SUPPORT SYSTEM

Charles B. Isgar, 1014 S. Ogden St., Denver, Colo. 80209, and Shirley K. Isgar, 1104 Maxwell, Boulder, Colo. 80302

Filed Jul. 13, 1984, Ser. No. 630,494
Int. Cl.[4] B65D *25/10, 25/16;* B65B *67/12*
U.S. Cl. 220—403 16 Claims



1. In a plastic bag support system for use in supporting a plastic bag in a container wherein the plastic bag has at least two handles adjacent the open end thereof and wherein each handle forms an opening between the handle and the body of the plastic bag, the improvement comprising:

an elongated, upstanding, sheet-like base;

at least a pair of spaced apart projections extending upwardly and outwardly from said base and having portions not in the plane of adjacent portions of said base;

adhesive means comprising double faced adhesive tapes secured to spaced apart portions of said base for securing said base to said container with said projections adjacent the open end of said container;

means on said projections for receiving at least a portion of at least one of said handles when said base is secured to said container to retain said handle in a position between said projections and said container; and

reinforcing means adjacent at least said spaced apart portions to resist forces tending to separate said base from said container when said base is secured to said container.

2. In a plastic bag support system for use in supporting a plastic bag in a container wherein the plastic bag has at least two handles adjacent the open end thereof and wherein each handle forms an opening between the handle and the body of the plastic bag, the improvement comprising:

an elongated, upstanding, sheet-like base;

at least a pair of spaced apart projections extending upwardly and outwardly from said base and having portions not in the plane of adjacent portions of said base;

adhesive means comprising at least one double face adhesive tape with one face secured to said base for securing said base to said container with said projections adjacent the open end of said container;

means on said projections for receiving at least a portion of at least one of said handles when said base is secured to said container to retain said handle in a position between said projections and said container;

said means on said projections including an upper surface having a generally arcuately shaped extremity so that portions of said one of said handles may be readily moved thereover; and

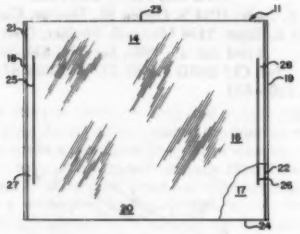
at least one notch adjacent to said generally arcuately shaped extremity for receiving a portion of said one of said handles.

4,558,801

CONFORMING LINER

Leonard J. Vilutis, Frankfort, Ill., assignor to Vilutis & Co., Inc., Frankfort, Ill.

Filed Aug. 9, 1984, Ser. No. 639,130
Int. Cl.⁴ B65D *5/56, 25/14*
U.S. Cl. 220—404 **15 Claims**



1. A conforming liner, comprising:

one panel of film material having a selected length and a selected height;

another panel of the film material having a length and a height substantially the same as the respective selected length and selected height of said one panel of film material;

said panels of film material having joined-together opposing edges thereof to form a sleeve-like member having an unsealed mouth;

a conforming seal spaced inwardly from at least one of said joined-together opposing edges, said conforming seal sealing a section of said one panel to an opposing section of said another panel and having a length that is less than said selected height of said panels of film material;

another conforming seal spaced inwardly from another of said joined-together opposing edges, said another conforming seal seals another section of said one panel to an opposing section of said another panel, said another conforming seal has a length that is less than said selected height of said panels of film material;

a cuff portion that extends in one direction between said joined-together opposing edges, and said cuff portion extends in another direction from approximately an end of each of said conforming seals to said unsealed mouth, said cuff portion being substantially free of said conforming seals and

said conforming seals are spaced apart by a distance that is not greater than approximately one-half of an inside periphery of a self-supporting container to be lined with said conforming liner.

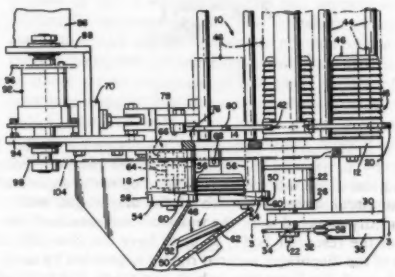
4,558,802

CAROUSEL TYPE DISPENSER

Robert E. Molison, Hanover, Pa., assignor to Elsner Engineering Works, Inc., Hanover, Pa.

Filed Jul. 5, 1984, Ser. No. 627,887
Int. Cl.⁴ G07F *11/12*
U.S. Cl. 221—11 **8 Claims**

1. A machine for dispensing caps or the like comprising a support plate having a smooth upper surface and a discharge hole extending through the plate at the surface, a carousel magazine rotatably mounted on the top of the plate over the hole including means for supporting a number of circumferentially spaced cap stacks for sliding movement over such surface with rotation of the magazine, and a magazine gear rotatably mounted below the plate; a magazine clutch forming a drive connection between the magazine gear and the magazine so that when the clutch is engaged rotation of the magazine gear rotates the magazine; a cap discharge assembly mounted below the plate under the hole for supporting cap stacks falling down the hole from the magazine including at least one rotary cap dispensing disk for dispensing individual caps from a cap stack and a disk drive gear connected to rotate the disk; a drive assembly including a drive motor, an output gear rotatably mounted below the plate, a chain drive clutch forming a drive connection between the drive motor and the output gear so that when the drive clutch is engaged the motor rotates the output gear, and a drive chain under the plate extending



around all of said gears whereby rotation of said output gear drives the chain to rotate said disk drive gear and said magazine gear; a sensor for generating a low level signal when the height of a cap stack in the cap discharge assembly falls to a level below the plate; and a control circuit operable in response to an input signal to engage the chain drive clutch without engaging the magazine clutch to thereby rotate the output gear, move the chain and rotate the dispensing disk sufficently to discharge a cap from the discharge assembly without rotating the magazine, said control circuit including means for engaging said magazine clutch upon receipt of a low level signal from the sensor so that when the chain drive clutch is next engaged in response to an input signal the cap discharge assembly discharges a cap as before and the magazine is rotated to position a cap stack to fall down the hole to resupply the discharge assembly.

4,558,803

MECHANISM FOR CONVERTING STACK ACCESS NEWSPAPER VENDING MACHINES AND THE LIKE TO MACHINES FOR DISPENSING PRODUCTS ONE AT A TIME

Reed T. Draper, 8305 Summerfeldt St., Saginaw, Mich. 48603, and Kenneth J. Pol, Saginaw, Mich., assignors to Reed T. Draper, Saginaw, Mich.

Filed May 24, 1984, Ser. No. 613,641
Int. Cl.⁴ B65H *3/06*
U.S. Cl. 221—229 **17 Claims**

1. Conversion improvements in vending machines for newspapers and like articles, which have access doors in their side walls for enabling the articles to be loaded in a stack to a cabinet and comprising:

a. a cabinet enclosure with side walls and a top wall;

b. a door hinged to one side wall and forming a part thereof;

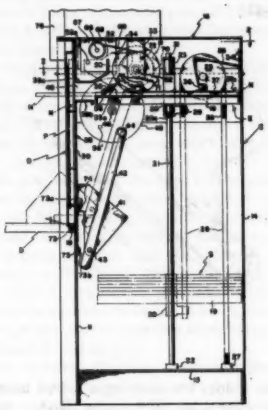
c. coin controlled latch mechanism for normally locking the door to the cabinet in closed position except when proper coins are fed to the mechanism;

d. a generally horizontally disposed platform and elevator mechanism supported by said cabinet for incremental

vertical movement therein and adapted to support a stack of said articles;

e. wall means behind said door, blocking access to said stack except for a dispensing opening for the dispensing of one article at a time near the upper end of the enclosure behind the upper portion of the door, which is accessible when the door is open;

f. means for moving said platform and elevator mechanism upwardly to dispose the topmost article opposite said dispensing opening;



g. a dispensing member mounted by the cabinet in engagement with the topmost article and movable in a path of travel to dispense the topmost article in the stack at least partly out said dispensing opening;

h. and linkage and drive mechanism connecting said door with said dispensing member such that opening of said door activates the dispensing member to dispense the topmost article, said linkage and drive mechanism including means for disabling the mechanism connecting said door and dispensing member during the terminal portion of the return travel of the door.

4,558,804

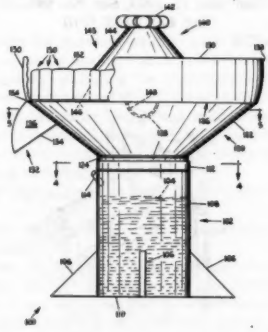
FOOD CONSUMPTION APPLIANCE

Terry W. Keck, 306 Cherry Hill Rd., Kalamazoo, Mich. 49007

Filed Aug. 19, 1983, Ser. No. 524,838

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—130 **16 Claims**



1. A food consumption appliance adapted for use by a human consumer on a table or similar surface for consuming a liquid and a comestible, such as cereal and the like, where said comestible is maintained in a substantially dry state separate from said liquid until actual consumption, said food consumption appliance comprising:

liquid storage means including a bottom, at least one side wall and an open top fillable by said consumer for storing said liquid separately from said comestible;

liquid extraction means located in an upper portion of said side wall of said liquid storage means and adapted to receive a straw or similar device for extracting said liquid from said liquid storage means as selectively desired by said consumer, whereby portions of said liquid are selectably extractable by said consumer from said liquid storage means;

dry comestible storage means rotatably mounted on and above said liquid storage means for holding portions of said dry comestible prior to consumption by said consumer, said dry comestible storage means proving a closure for the open top of said liquid storage means;

spout means communicating with and positioned below said dry comestible storage means, and adapted to be partially received or otherwise positioned adjacent the mouth of said consumer for providing a slideway for said portions of said dry comestible dispensed by said comestible storage means directly into said consumer's mouth;

means for dispensing selected portions of said dry comestible sequentially into said spout means upon rotation of said comestible storage means with respect to said liquid extraction means so as to sequentially dispense said portions of said dry comestible into said spout means; and

said liquid extraction means is positioned adjacent said spout means so as to conveniently allow said consumer to extract portions of said liquid from said liquid storage means subsequent in time to said consumer receiving one or more of said portions of said dry comestible.

4,558,805

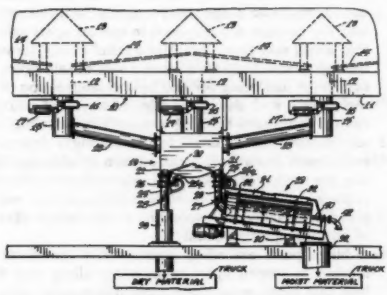
FLUENT SOLID MATERIAL HANDLING SYSTEM

Elwood R. Margison, Downers Grove, Ill., assignor to United Conveyor Corporation, Deerfield, Ill.

Filed Apr. 13, 1983, Ser. No. 485,222

Int. Cl.[4] B65G *3/04*

U.S. Cl. 222—133 **2 Claims**



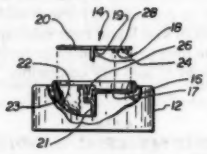
1. In a system for handling fluent solid material which includes a transfer hopper, duct means for delivering material to said transfer hopper, means for controlling the flow of material through said duct means, and an upright feed conduit the upper end of which communicates with the bottom of the transfer hopper to receive material from said hopper for unobstructed gravity flow, the improvement comprising, in combination:

a feed valve to control movement of material into the upper end of the feed conduit;

a material flow transducer which includes a sensor in the

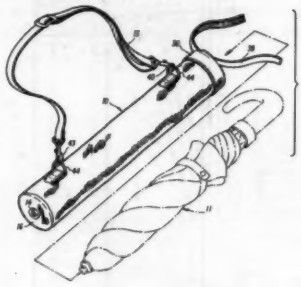
feed conduit to continuously sense the volume of material flowing through the conduit;
means operatively associated with the transducer and with the feed valve to control the position of the valve in response to the sensed volume of material flowing through the feed conduit so as to closely control the rate at which material flows from said conduit;
a moistening chamber in direct communication with the bottom of the feed conduit;
means for introducing liquid into the moistening chamber at a controlled rate;
means for moving moistened material from the moistening chamber to a transport device;
a feed bypass conduit that also communicates with the bottom of the transfer hopper to feed material directly into a transport device;
a feed valve in the upper end of said feed bypass conduit;
a material flow transducer which includes a sensor in the feed bypass conduit;
and means for selectively closing the feed valve in one or the other of said conduits.

4,558,806
CONDIMENT CAP
Lyle F. Shabram, Sr., P.O. Box 5537, Carmel, Calif. 93921, and Lyle F. Shabram, Jr., 1215 Surf Ave., Pacific Grove, Calif. 93950
Filed Jan. 20, 1984, Ser. No. 572,377
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—556 **8 Claims**



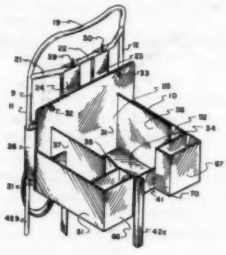
1. A condiment container cap comprising:
a cap body suitable for attachment to a condiment container and having a top surface, including,
a plurality of pouring apertures formed in an array in said top surface on a first side of a pivot line extending thereacross, two hinge post receiving cavities formed in said top surface and disposed in spaced apart relationship along said pivot line, and a relief cavity formed in the top of said body on a second side of said pivot line, said pivot line being formed by the intersection of said top surface with the upper edge of a wall of said relief cavity; and means forming a coverflap including
a substantially rigid planar closure having a depressable end portion and a sealing end portion divided by a hinge line, the sealing end portion having a plurality of sealing protrusions extending downwardly therefrom and disposed in an array corresponding to that of said plurality of pouring apertures, and
two hinge posts extending downwardly therefrom and located in spaced apart relationship along said hinge line, said hinge posts being formed integrally with said sealing end portion and attached thereto by living hinges formed of thinned elongated portions of said coverflap of thickness substantially less than the thickness of said hinge posts, said elongated portions being disposed in spaced apart relationship with their longitudinal axes being colinear and defining said hinge line, said hinge posts being disposed in said hinge post receiving cavities such that said hinge line lies directly above said pivot line thereby permitting said coverflap to engage said upper edge and be rotated about said pivot line between a closed position and an open position, said sealing protrusions being disposed in sealing engagement with said pouring apertures when said coverflap is in said closed position and being withdrawn from said sealing engagement when said depressable end is rotated into said relief cavity.

4,558,807
UMBRELLA HOLDER
André J. Jackson, 3978 Woodhue Pl., Alexandria, Va. 22309
Filed Mar. 21, 1984, Ser. No. 592,015
Int. Cl.[4] A45B *25/24*
U.S. Cl. 224—251 **7 Claims**



1. A separate holder for carrying a closed umbrella of the type having a telescoping stem and a handle, the holder in combination with the umbrella comprising:
a non-metallic sheath having first and second ends wherein the first end is always open and wherein the handle of the umbrella protrudes beyond the first end when the umbrella is inserted into the non-metallic sheath, the sheath having a substantially cylindrical shape and a diameter approximating that of a closed umbrella, the sheath including non-metallic stiffening means and a smooth inner surface, wherein the closed umbrella slides easily in and out of the first end of the sheath;
a carrying strap secured to the sheath at spaced locations thereon for carrying the holder suspended from a user's shoulder, and
means for securing the umbrella in the sheath without closing the first end thereof.

4,558,808
CHAIN SAW CARRYING BACKPACK
Paul H. Fullmer, 485 S. 300 East, Cedar City, Utah 84720
Filed Nov. 25, 1983, Ser. No. 555,210
Int. Cl.[4] A45F *3/10*
U.S. Cl. 224—270 **10 Claims**



1. A backpack for a chain saw comprising:

a backpack tubular frame assembly having a plurality of vertically disposed tubular members and a plurality of horizontally disposed cross bracing tubular members, a pair of said vertically disposed tubular members extending below the lowermost cross bracing tubular member a sufficient distance to form a pair of first leg members;

a box-like chain saw support assembly having:

a substantially planar vertical rear member having means to attach a box-like assembly to said tubular frame,

a pair of inner sidewall members vertically aligned and abutting against said vertical rear member, said sidewall members being substantially parallel to one another and spaced a sufficient distance apart to receive a chain saw motor therebetween,

a bottom planar member joined to said sidewall members to form a floor for said box-like assembly, said bottom member having a substantially horizontally oriented elongated opening therein having a longitudinal axis oriented substantially perpendicular to said backpack frame, said aperture adapted to receive the handle of a chain saw such that the base of the chain saw motor adjacent the handle, upon insertion of said handle through said aperture, rests on the bottom member, and

a forward wall member joining the forward portions of the bottom member and the sidewall members, said forward wall member having sufficient height above the bottom member to prevent a chain saw lodged within the box-like assembly with its handle protruding through the bottom member from being dislodged in a forward direction; and

a third leg member, attached to said box-like assembly and positioned with respect to said two first leg members to provide a stable support for said backpack when it is rested upon the ground.

4,558,809

GRIPPER FEED SYSTEM FOR BLANKING PRESSES OR THE LIKE

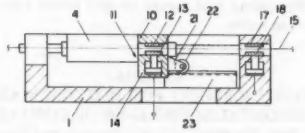
Hans Schoen, Lange Horst 87, 4320 Hattingen, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,234

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240860

Int. Cl.⁴ B65H *17/36, 17/44*

U.S. Cl. 226—162 **5 Claims**



1. Apparatus for moving material such as metal sheets or strip in a production machine such as a blanking press or the like, said apparatus including the combination of:

two spaced-apart and parallel, fluid-actuated, double-acting jacks each including two piston rods extending out of a cylinder in opposite directions from a common piston, said cylinder reciprocating on the piston along an axis extending along said piston rods,

means for supporting the ends of the piston rods of said jacks,

a cross member rigidly interconnecting the cylinders of said jacks, and

at least two transport grippers each including two gripper elements having an adjustable gap therebetween supported by said cross member between the cylinders of said jacks, each of said grippers further including an actuator supported by said cross member to move the gripper elements into engagement with the material at opposite sides thereof by closing a gap between the gripper elements, which gap extends in a plane containing said axis of each of said jacks.

4,558,810

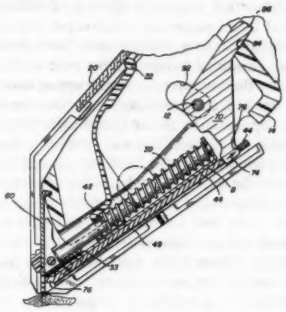
SURGICAL STAPLER CONSTRUCTION

Paul J. Mulhauser; Douglas M. Spranger; Malcolm J. Brookes, and Karl D. Kirk, III, all of New York, N.Y., assignors to Richard-Allan Medical Industries, Inc., Richland, Mich.

Filed Dec. 9, 1983, Ser. No. 560,074

Int. Cl.⁴ A61B *17/04*

U.S. Cl. 227—19 **9 Claims**



1. A surgical stapler for clinching surgical staples in the body of a patient, comprising a housing; staple guide means in said housing for guiding surgical staples toward one end of said stapler; an anvil received within the guide means interior and having an end portion about which staples are formed; said end portion projecting from one end of said guide means; a reciprocally movable former in said housing for forming a staple about the anvil projecting end portion; a pivotally movable trigger movable relative to said housing for actuating said former into a staple-forming position relative to said anvil end portion; pivotal toggle means in said trigger connected to said anvil for translating pivotal movement of said trigger toward said housing into a slidable axial movement of said anvil away from said former after said former has deformed a staple about said anvil projecting end portion; said slidable axial movement being terminated as said trigger is moved toward said housing.

4,558,811

NAIL DRIVING TOOL

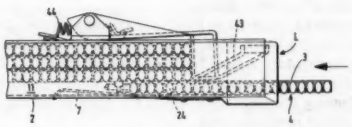
Artur F. Klaus, Frankfurt am Main, Fed. Rep. of Germany, assignor to Signode Corporation, Glenview, Ill.

Filed Mar. 9, 1984, Ser. No. 588,094

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308630; Mar. 11, 1983, 3308698

Int. Cl.⁴ B25C *1/04, 1/07*

U.S. Cl. 227—116 **13 Claims**



1. A nail driving tool comprising a drive channel, a driver reciprocably slidable in said channel for driving nails directed thereto into a workpiece, and a magazine defining a channel cooperating with said drive channel through which successive nails are fed into said drive channel to be contacted by said driver during each cycle of operation of said driver, means for

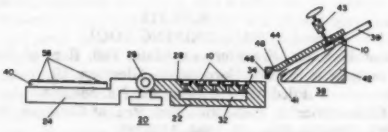
feeding successive nails from said magazine into said drive channel, said magazine being stationarily disposed relative to said tool and having a width suitable for receiving two or more parallel rows of nails and defining a surface against which the nail rows are forced, said surface being formed by a sidewall of the magazine, and means for biasing the rows of nails in a direction normal to the planes of the nail rows against a surface disposed in alignment with the cooperating channels of the drive tool and magazine and defined by one of said magazine or driving tool, pneumatically operated latch means disposed adjacent the row of nails being fed into the drive channel and positioned to engage the nail row to move a nail into position beneath the driver for repetitive driving of said nails into a workpiece, said latch means are constructed and arranged to move in one direction to positively move nails into the drive channel but are permitted to move in the reverse direction free of said nail row, the latch means comprises at least one latch adjacent the surface and provided on a conveyor cylinder pneumatically operable in the longitudinal direction of the magazine and, if the nails of the nail rows are disposed at a space from one another that the latch can engage between the individual stems, the working stroke of the conveyor cylinder being twice as large as the distance between two nails in the nail row, and, if the nail stems in the nail row are located directly adjacent one another so that it is impossible for the latches to engage between the nail stems, then a respective latch engages behind the backmost nail of a nail row and at least two latches are provided in series in the longitudinal direction of the magazine, the working stroke being at least one nail length greater than the distance from one latch to the next one lengthwise of the magazine whereby a row of nails is in alignment with the cooperating channels of said magazine and driving tool and successive nails from the rows of nails are fed into said drive channel until the magazine is emptied.

4,558,812

METHOD AND APPARATUS FOR BATCH SOLDER BUMPING OF CHIP CARRIERS

Alred S. Bailey, Hopewell Township, Mercer County, and John R. Fisher, Jr., Hillsborough Township, Somerset County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Nov. 7, 1984, Ser. No. 668,973
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—180.1 **8 Claims**



1. A method of forming solder bumps on contact pads of chip carriers, the method comprising the steps of:
dispensing a plurality of chip carriers into an array of cavities of a planar holder;
applying a vacuum to hold said carriers in said cavities;
positioning the holder, with the chip carriers held therein, proximate to a plate having a plurality of arrays of dimples therein, each dimple containing a solder preform;
releasing the vacuum to place the pads in contact with the solder preforms; and
heating the preforms to form a solder bump on each pad.

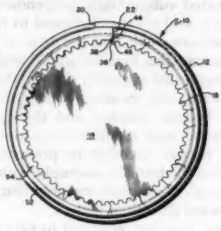
6. A soldering apparatus for forming solder bumps on contact pads of chip carriers, comprising:
a plate having a plurality of arrays of dimples, each sized to receive a solder preform therein;
a planar holder having an array of cavities therein and rotatably connected to the plate;
means for dispensing a plurality of chip carriers in the cavities;
a vacuum means for holding the chip carriers in the cavities; and
means for releasing the vacuum to place the pads in contact with the solder preforms prior to heating the preforms to form a solder bump on each pad.

4,558,813

CONTAINER AND SIDEWALL BLANK HAVING SINUSOIDAL EDGE PATTERN

Frank P. Richards, Prairie Village, Kans., assignor to Sealright Co., Inc., Kansas City, Mo.

Filed Jul. 1, 1982, Ser. No. 394,100
Int. Cl.[4] B65D *3/14*
U.S. Cl. 229—4.5 **5 Claims**



1. A container comprising:
a sidewall formed by a sheet having top and bottom edge portions and a pair of side edge portions, said sheet being formed in a convolute tubular shape with said side edge portions sealed together and said bottom edge portion terminating in a sinusoidal edge;
a bottom member having upper and lower surfaces and a substantially circular periphery;
a flange formed by crimping said bottom edge portion of the sheet generally radially inwardly beneath said bottom member with said flange located adjacent the lower surface of said bottom member and the entirety of said sinusoidal edge located radially inwardly of said circular periphery of the bottom member; and
means for sealing said flange to said lower surface of said bottom member.

4,558,814

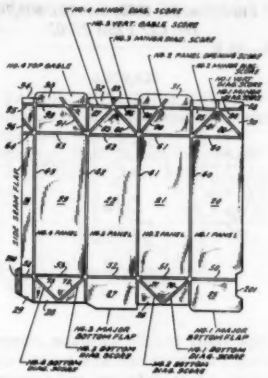
REINFORCEMENT FOR BOTTOM MAJOR HORIZONTAL SCORE LINE OF CONTAINER

Richard C. Ihde, Strongsville, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 14, 1983, Ser. No. 560,890
Int. Cl.[4] B65D *5/08*
U.S. Cl. 229—17 R **3 Claims**

1. A blank for forming a container, said blank comprising:
generally rectangular first side panel, second side panel, third side panel, fourth side panel and side seal flap consecutively articulated along parallel score lines;
first through fourth bottom flaps and a bottom seal flap articulated respectively to said first through fourth side panels and said side seal flap along score lines that are generally collinear and are generally perpendicular to the score lines intermediate said first through fourth side panels;
an unscored reinforcing tab extending integrally from at least portions of said bottom seal flap and said side seal flap, whereby on the container erected from said blank, the reinforcing tab extends across the score line between said first side panel and said first bottom panel thereby preventing spreading of the score line when the container

is filled; and wherein portions of said first side panel and said first bottom panel generally opposite said second side panel and said second bottom panel include a notch having substantially the identical shape as said reinforcing tab, whereby a plurality of said blanks can be formed from a single sheet of material with the notches in one said blank defining the reinforcing tabs in an adjacent said blank.



4,558,815

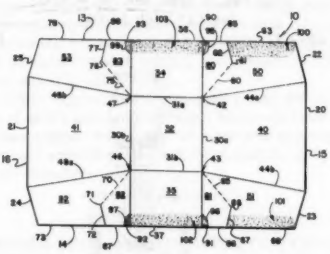
NESTING OPEN-TOP CONTAINERS FOR POPCORN AND THE LIKE

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Continuation of Ser. No. 463,282, Feb. 2, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 710,960

Int. Cl.[4] B65D *5/24*

U.S. Cl. 229—31 R **13 Claims**



1. A blank for making an open-top container for popcorn and the like, comprising:

a single substantially rectangular blank having a first pair of scores extending transversely in the direction of the width of said blank and a second pair of scores extending longitudinally in the direction of the length of said blank,

said first pair and said second pair of scores defining a bottom panel near the center of said blank;

a pair of short side walls joined to opposite sides of said bottom panel, each being defined by said first pair of scores and one of said second pair of scores;

a pair of long side walls joined to the remaining opposite sides of said bottom panel, each being defined by a pair of diagonal scores originating at said bottom panel and extending to an edge of said blank;

four side wall panel halves, each being defined by one of said diagonal scores, a diagonal fold line originating at the point at which said diagonal scores intersects said bottom panel and extending between said one of said diagonal scores and a portion of one of said first pair of scores towards an edge of said blank but terminating short of said edge at a point, and a first cut line extending from a longitudinal edge of said blank toward said diagonal fold line and terminating at said point;

four connecting panels, joined to one of said short side walls along one of said first pair of scores and joined to one of said side wall panel halves along one of said diagonal fold lines,

said cut lines allowing a portion of each of said side wall panel halves to be positioned in overlapping relationship with a portion of another one of said side wall panel halves,

each short side wall, the adjacent connecting panels joined to said short side wall, and the side wall panel halves joined to said adjacent connecting panel halves including contiguous collinear edge segments defining a collinear longitudinal edge of said blank, and

tab means attached to each of said short side walls and positionable adjacent to a surface of one of said side wall panel halves for providing a surface to which an adhesive may join said one of said short side walls to said one of said side wall panel halves;

whereby each of said connecting panels is positioned between one of said short side walls and one of said side wall panel halves, and a portion of each of said side wall panel halves is positioned in overlapping relationship with a portion of another one of said side wall panel halves when said blank is formed into a container.

4,558,816

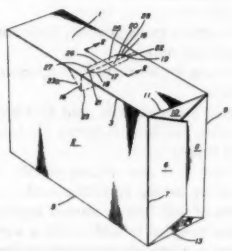
INTEGRAL CARRYING HANDLE FOR A CAN CARTON

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 27, 1984, Ser. No. 655,217

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **16 Claims**

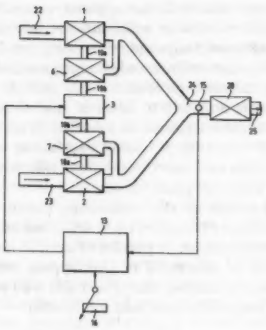


1. A carrying handle for a carton for packaging a plurality of cans and having interconnected top, bottom, and side walls and end closure panels, said handle comprising a perforated transverse slit extending completely across one of said interconnected carton walls and having end projections disposed in substantially perpendicular relation to said one of said interconnected carton walls and extending into the two carton walls interconnected therewith, a transverse handle flap struck from said one of said interconnected carton walls and foldably joined thereto by a transverse fold line generally parallel to said transverse slit and spaced therefrom, and a second transverse handle flap struck from said one of said interconnected carton walls and foldably joined thereto by a transverse fold line generally parallel to and spaced from said perforated transverse slit, said perforated transverse slit defining coincidental transverse edges of both of said handle flaps.

4,558,817
ELECTRONICALLY CONTROLLED MIXING VALVE

Harro Kiendl, Witten-Bommern, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Jul. 28, 1981, Ser. No. 287,621
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030765
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.12 7 Claims



1. A mixing valve arrangement for mixing hot water from a first supply line and cold water from a second supply line to obtain a mixture of said hot and cold water at an outlet, said arrangement comprising:

first means for preselecting the temperature of said mixture;

a first supply valve coupled between said first supply line and said outlet;

a second supply valve coupled between said second supply line and said outlet;

second means for sensing the temperature of said mixture at said outlet;

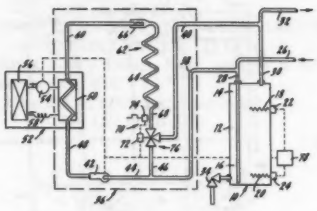
third means responsive to said first and second means for generating mechanical forces for actuating said first and second supply valves;

each of said first and second supply valves comprising a valve body having an inlet chamber coupled to a respective one of said first or second supply lines and an outlet chamber coupled to said outlet, a valve opening between said first and second chambers, a movable valve cone for controlling fluid flow through said opening, a movable valve spindle extending from said valve body and displaceable in response to said mechanical forces, and an elastically deformable element coupled between said valve cone and said valve spindle for transmitting movements of said spindle to said valve cone, said deformable element being responsive to fluid pressure in said valve such that an increase in said fluid pressure causes deformation of said deformable element in a first direction to carry said valve cone in a direction to decrease fluid flow through said valve opening and a decrease in said fluid pressure causes deformation of said deformable element in a second direction to carry said valve cone in a direction to increase fluid flow through said valve opening, whereby fluid pressure downstream of said outlet chamber is maintained constant regardless of pressure variations in said inlet chamber.

4,558,818
BATCH-TYPE WATER HEATING APPARATUS

James R. Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,760
Int. Cl.[4] F25B *27/02*
U.S. Cl. 236—25 R 21 Claims

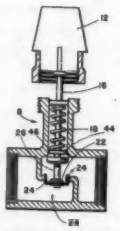


2. Batch-type water heating apparatus comprising a water heater including a water storage tank; a water circulating loop including a pump, a heat exchanger, and a water storage zone; means establishing fluid communication from the outlet of said zone to the upper portion of said tank and establishing fluid communication from the lower portion of said tank to said loop; and flow control means sensitive to the water temperature in said loop, said flow control means preventing said fluid communication when the sensed water temperature in said loop is below a predetermined value and allowing said fluid communication when the sensed water temperature in said loop exceeds a predetermined value.

4,558,819
AUTOMATIC VALVE CLOSER TO PREVENT TAMPERING WITH A THERMOSTATIC CONTROLLED RADIATOR

Robert McDonald, 128 Eagle St., Emmaus, Pa. 18049

Filed Feb. 9, 1984, Ser. No. 578,507
Int. Cl.[4] F24F *11/06*
U.S. Cl. 236—42 10 Claims



1. In a cartridge for use in a nonelectric, thermostatic valve sensor, said cartridge including a temperature sensing means workably attached to a push rod, an upper elongated stem, spring means operably connected to said upper stem, said upper stem terminating in an orifice sealing means, said upper stem being of a predetermined length and said sealing means being of a predetermined width to sealingly close an orifice in a steam and/or hot water heating system from outside said system, the improvement comprising:

(a) a lower connected stem extension of said upper stem, said stem extension passing through said orifice, said lower stem extension terminating in

(b) an additional orifice sealing means of sufficient width to sealingly close said orifice from within said heating system, said lower stem extension being of a predetermined length to permit said additional orifice sealing means to

remain below and spaced apart from said orifice while said sensor is operational, but which stem length allows said additional orifice sealing means to sealingly close said orifice when said sensing means is disconnected and said upper and lower stems retract in response to said spring's operation.

4,558,820

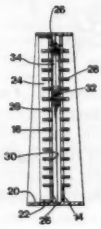
VAPOR-DISPENSING DEVICE

William C. Harris, Jr., Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 25, 1983, Ser. No. 488,288

Int. Cl.[4] A61L 9/04

U.S. Cl. 239—56 **7 Claims**



1. A device for dispensing air-treating vapors comprising:

a frame having an inner peripheral surface;

first and second support members mounted across the frame, said support members having facing, substantially parallel, non-deformable planar support surfaces, at least one of such support members having an outer peripheral surface mating frictionally with said inner surface and being slidable linearly along said inner frame surface to adjust the spacing between such surfaces and at least one of such support surfaces being apertured;

a flexible, generally flat dispenser sandwiched between the support surfaces and having an inner storage container of vaporizable air-treating composition which is burstable by sandwiching pressure exerted manually through the support surfaces by said relative movement to release the composition for dispensing;

said slidable support member engaging said peripheral surface of said frame with sufficient frictional force to maintain said support surfaces in such reduced spacing without continued manual pressure to hold said flexible dispenser tightly therebetween.

4,558,821

TRIGGER-TYPE SPRAYER WITH INTEGRALLY FORMED HOUSING, TRIGGER, NOZZLE AND CYLINDER

Tetsuya Tada, Tokyo; Kazuyuki Kawamoto, and Akihiko Yamada, both of Onoda, all of Japan, assignors to Canyon Corporation, Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 543,026

Claims priority, application Japan, Mar. 3, 1983, 58-34940; Jul. 27, 1983, 58-137387

Int. Cl.[4] B05B 9/043

U.S. Cl. 239—333 **32 Claims**

1. A trigger-type sprayer which sucks up, pressurizes and sprays a liquid contained in a container having a mouth portion, the sprayer comprising:

a housing attached to the mouth portion of the container;

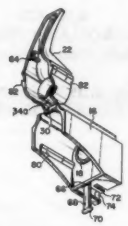
a trigger rockably attached to one end portion of the housing and integrally formed with the housing in one piece;

a nozzle formed on the trigger, said nozzle being integrally formed with the trigger in one piece and having an orifice;

a cylinder supported at the middle portion on the housing, said cylinder being integrally formed with the housing in one piece and having opposite end portions, one end portion being capable of facing the orifice;

a suction tube attached to the other end portion of the cylinder and connecting the interior of the cylinder with the interior of the container;

a hollow piston one end of which is connected to the nozzle and the other end of which is slidably located in the cylinder, said piston being in slidable contact with the inner surface of the cylinder; and



valve means adapted to close and open the nozzle and the suction tube, respectively, when the trigger is rocked in one direction relative to the housing, and to open and close the nozzle and the suction tube when the trigger is rocked in the other direction relative to the housing.

4,558,822

BINARY ATOMIZING NOZZLE

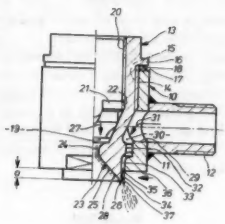
Wolfgang Nieuwkamp, Kappishäusern, Netherlands, and Sepp Mezger, Eningen, Fed. Rep. of Germany, assignors to Lechler GmbH & Co. KG, Fellbach, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,345

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3230977

Int. Cl.[4] B05B 7/10

U.S. Cl. 239—403 **20 Claims**



1. A binary atomizing nozzle, comprising;

(a) a housing including a liquid insert and a gas insert;

(b) said liquid insert having an interior chamber with a liquid inlet and a liquid discharge communicating with said chamber;

(c) a spin insert positioned in said chamber intermediate said liquid inlet and said liquid discharge providing rotational motion to liquid flowing through said chamber so that the liquid exits said liquid discharge as generally a hollow cone;

(d) means associated with said chamber positioning said spin insert so that the liquid flows along a wall portion of said chamber to said liquid discharge and thereby constantly wets said wall portion;

(e) said liquid insert having an outer portion thereof proximate said liquid discharge and spaced from said gas insert providing a generally axially extending channel and said channel having a gas discharge;

(f) said liquid discharge axially spaced a preselected distance from said gas discharge; and,

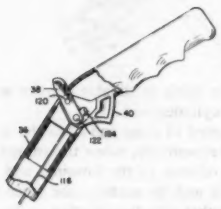
(g) said gas insert includes means supplying pressurized gas to said channel so that gas exiting said gas discharge flows along said outer portion of said liquid insert according to the Coanda effect whereby liquid exiting said liquid discharge is atomized by the gas flowing along said outer portion.

4,558,823

SPOTTING CONTROL AND TRIGGER ASSEMBLY

Hugh F. Groth, Richfield, Ohio, assignor to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,557
Int. Cl.[4] B05B *7/26*
U.S. Cl. 239—413 **6 Claims**



1. A cleaning device comprising:

a source of water;

a source of cleaning fluid;

means connected to said water and cleaning fluid sources for mixing said water and cleaning fluids;

a nozzle in flow receiving relationship with said mixing means for dispensing the mixed fluid;

control means connected to said mixing means for determining the rate of flow to said nozzle and determining the mixing ratio of water and cleaning fluid;

first actuator means connected to said control means for selecting said rate of flow of water and cleaning fluid from said mixing means to said nozzle;

second actuator means connected to said control means for selecting said mixing ratio, a common linkage connecting said first and second actuator means to said control means, and said first actuator means is capable of moving said linkage a first distance and said second actuator means is capable of moving said linkage a second distance greater than said first distance.

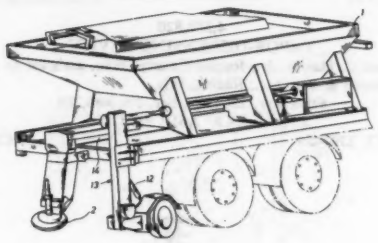
4,558,824

MATERIAL SPREADING VEHICLE WITH HYDRAULIC WHEEL PUMP

Jens Petersen, Vamdrup, Denmark, assignor to K/S Epoke, Vejen, Denmark

Continuation of Ser. No. 443,890, Nov. 23, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,608
Int. Cl.[4] A01C *17/00*; B05B *9/06*
U.S. Cl. 239—684 **1 Claim**

1. In a spreading apparatus for use on a vehicle: a container for holding spreading material; a dosing device for withdrawing spreading material from the container, said dosing device including at least one driven member in contact with spreading material in the container and a hydraulic motor drivingly connected to said member whereby when the container is empty said motor is essentially unloaded; a driving wheel assembly including a road-engageable driving wheel and an adjustable suspension device for lowering and raising the driving wheel to thereby engage and disengage the driving wheel with the surface of the road, said assembly also including a hydraulic device which when pressurized urges the driving wheel downwardly for engagement with the road; a hydraulic pump drivingly coupled to the drive wheel; and a hydraulic system for conveying hydraulic pressure from said pump to said hydraulic motor to operate said dosing device and to said hydraulic device to urge said driving wheel downwardly during a spreading operation, the hydraulic system being so



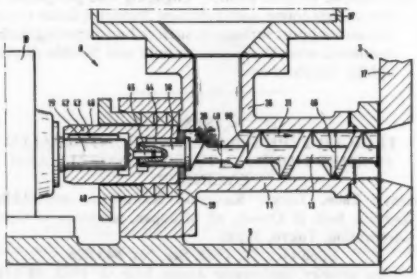
arranged that, upon unloading of said hydraulic motor as a result of the container becoming empty, the resulting reduced pressure in said hydraulic system reduces the pressure in said hydraulic device thereby reducing the downward urging force on said driving wheel, the arrangement being that the pressure relief of the hydraulic device is thereby effected automatically.

4,558,825

AGITATOR MILL

Willy John; Norbert Klimaschka, both of Selb; Arno Wagner, Bochum, and Günther Meyer, Selb, all of Fed. Rep. of Germany, assignors to Gebruder Netzsch Maschinenfabrik GmbH & Co., Selb, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,366
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219549; Sep. 10, 1982, 3233626
Int. Cl.[4] B02C *17/18*
U.S. Cl. 241—171 **8 Claims**



1. An agitator mill comprising

a grinding vessel (3) which encloses a grinding area,

said grinding vessel being sealed against the outer environment,

a storage vessel (37) which contains grinding bodies (28),

and a device (8) for feeding said grinding bodies (28) from said storage vessel (37) into said grinding area,

said device including a housing (11) and a rotatable worm (13) disposed therein,

said storage vessel along with said grinding vessel being also tightly sealed against the outer environment.

4,558,826

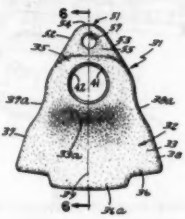
HAMMER FOR AUTOMOBILE SHREDDING MILLS

John J. Martinek, Andover, Minn., assignor to Evans Products Company, Wilmington, Del.

Continuation of Ser. No. 397,530, Jul. 12, 1982, abandoned. This application Aug. 8, 1984, Ser. No. 639,525

Int. Cl.[4] B02C *13/04, 13/28*

U.S. Cl. 241—189 R 17 Claims



1. An improved hammer casting for a shredding mill in which pluralities of hammers are swingably mounted on rotated shafts, the improved hammer casting comprising:

a hammer body cast with a substantially bell-shaped profile defined by first and second faces, first and second ends and first and second sides, the second ends being wider than the first end, and the first and second sides being tapered and interconnecting the first and second ends, the body having a transverse dimension defined by the distance between the first and second faces;

a mounting bore extending transversely through said body from the first face to the second face, the nounting bore having a predetermined diameter and being disposed from the first end a distance aaproximating ½ of said predetermined diameter, the mounting bore adapted to receive a pivot shaft to mount the hammer body with said second end swingable to engage and shred material fed to the mill;

and a lifting eye member integrally cast with the hammer body and projecting from said first end away from the mounting bore, the lifting eye member comprising

first and second sides that extend in tapered fashion from the first and second sides of the hammer body, converging at an apex;

first and second faces that extend in tapered fashion from the first and second faces of the hammer body, converging at said apex;

an aperture formed through the lifting eye member that is smaller by comparison than the mounting bore to define a lifting eye;

the lifting eye having a transverse dimension defined by the distance between its first and second faces, and a smallest transverse dimension proximate the apex, said smallest transverse dimension being at least about ½ the minimum transverse dimension of the hammer body.

4,558,827

APPARATUS FOR SHREDDING DOCUMENTS

Zoltan Berger, Ueberlingen, Fed. Rep. of Germany, assignor to Borbe-Wanner AG., Switzerland

Filed Mar. 28, 1983, Ser. No. 479,722

Claims priority, application Switzerland, Mar. 30, 1982, 1950/82

Int. Cl.[4] B02C *18/16*

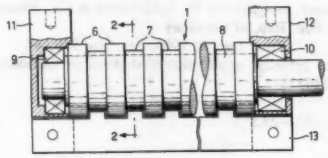
U.S. Cl. 241—224 20 Claims

1. An apparatus for shredding documents, comprising:

a rotary cutter having a generally cylindrical body and a plurality of cutting teeth of different heights extending radially from said body, said cutting teeth being arranged in a plurality of discrete axially extending, parallel and straight rows of alternating relatively taller cutting teeth and relatively shorter cutting teeth within each row each of said taller teeth having a first radial height, each of said shorter teeth having a second radial height, said first and second heights being defined by

$$b \leqq a - b$$

wherein



a=said first height and

b=said second height; and

a serrated member fixedly mounted adjacent said rotary cutter and having a profiled edge providing serrations conforming to and mating with said shorter and taller cutting teeth.

4,558,828

FISHING REEL

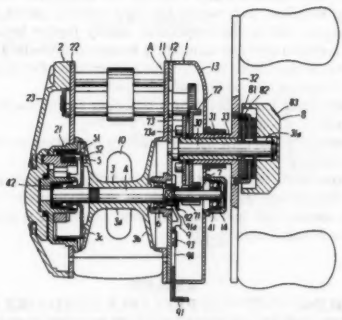
Shinichi Morimoto, Nishinomiya, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 17, 1984, Ser. No. 601,319

Claims priority, application Japan, Apr. 20, 1983, 58-60278[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—7.19 3 Claims



1. A fishing reel, comprising a reel body, a spool having a spool shaft supported rotatably to said reel body, a handle shaft supported rotatably to said reel body, a handle supported to said handle shaft for applying to said spool a driving force to drive said spool, a transmission mechanism for transmitting the driving force from said handle to said spool, said handle shaft projecting outwardly relative to said reel body, said handle being supported on said handle shaft at an intermediate portion of said handle shaft, said handle shaft projecting outwardly relative to said handle, and a drag mechanism for applying a resistance to reverse rotation of said handle relative to said handle shaft, said handle being interposed between said reel body and said drag mechanism, said transmission mechanism comprising a main gear rotatably supported to said handle shaft, a pinion engageable with said main gear and supported to said spool shaft, an anti-reverse-rotation gear, and engaging means for coupling said main gear and said handle such that a driving force can be transmitted by said handle to said main

gear, said anti-reverse-rotation gear being fixed to said handle shaft.

4,558,829

AUTOMATIC COIL WINDING MACHINE

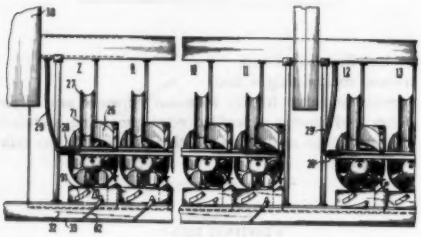
Ulrich Aretz, Korschenbroich; Herbert Knors; Wilhelm Maassen, both of Monchen-Gladbach; Franz-Josef Reiners, Ratheim, and Leo Tholen, Heinsberg, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,866

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245325

Int. Cl.⁴ B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **22 Claims**



1. Automatic coil winding machine having a multiplicity of winding stations for which supply coil magazines with respective rotary feeders are provided, and having a loading device for loading the magazine with supply coils which are moved by transporting means, which include a conveyor belt, to the magazines, each of the supply coil magazines having a filling location for automatically loading the magazine, and an unloading location, and means for continuously storing at least one supply coil in the respective rotary feeder between the filling location and the unloading location, including a device proximal to the filling location for prevention of overfilling the filling location, the device which comprises:

a switchable transport means unloader for unloading excess coils;

a sensor for monitoring the loading condition at the filling location;

linkage from the sensor to the switchable transport means unloader operatively engaging the unloader for unloading an excess coil when an overload condition is detected at the filling location.

4,558,830

HANDLING UNIT FOR REELABLE CORD-LIKE GOODS AND ITS USE IN AN INTEGRATED HANDLING SYSTEM

Stig A. Larsson, Lomvägen 253, S-191 56 Sollentuna, Sweden

PCT No. PCT/SE81/00377, § 371 Date Aug. 18, 1982, § 102(e) Date Aug. 18, 1982, PCT Pub. No. WO82/02187, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 16, 1981, Ser. No. 413,361

Claims priority, application Sweden, Dec. 19, 1980, 8009008

Int. Cl.⁴ B65H *67/06;* **B65G** *37/00;* **G05B** *15/00*

U.S. Cl. 242—54 R **21 Claims**

1. A handling system for cord-like goods comprising:

a plurality of work stations at least one of which including a rotary drive mechanism,

said rotary drive mechanism comprising a movable arm and a power-driven actuator for moving said arm,

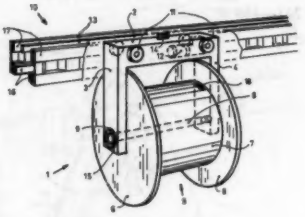
means defining a guide path leading to said work stations,

a handling unit movable along said guide path between said work stations and comprising:

a self-propelled support structur having means mountable on the guide path for movement therealong,

propulsion means including a motor on said support structure for moving said support structure along the guide path,

a reel rotatably mounted on said support structure and upon which the cord-like goods can be coiled and uncoiled,



a drive coupling member connected to said reel and connectible to the rotary drive mechanism at said one work station for rotating the reel, and

a common control unit operably connected to both said propulsion means and said power driven actuator for actuating same.

4,558,831

APPARATUS FOR DRIVING TAPES

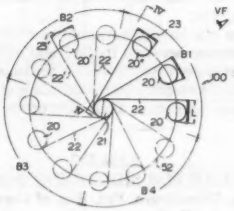
Tosinobu Futagawa, 5-21-2-503, Higashigotanda, Shinagawa-ku, Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,823

Claims priority, application Japan, Aug. 5, 1982, 57-136538; Oct. 28, 1982, 57-189786; Dec. 20, 1982, 57-223273

Int. Cl.⁴ G11B *3/30, 23/12*

U.S. Cl. 242—55 **8 Claims**



1. A tape-driving apparatus for positioning a desired portion of a tape in a predetermined station, said apparatus comprising a first roller, a plurality of second rollers arranged parallel to the first roller, a plurality of tapes, each of which is wound from its one end on an associated second roller and all of which are wound together from their other ends on the first roller, first means for positioning at least one of the second rollers in a predetermined station, and second means for rotating said second roller or second rollers and the first roller to bring a desired portion of the tape in said predetermined station.

4,558,832

TAKE-UP MECHANISM FOR SAFETY BELTS

Karl E. Nilsson, Ottobrunn, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft für flugchemische Antriebe mit beschrankter Haftung, Fed. Rep. of Germany

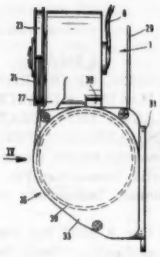
Filed Apr. 27, 1983, Ser. No. 489,091

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215925

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107 4 Claims



1. A winding mechanism for safety belts in vehicles comprising:

a take-up assembly having a frame, a reel rotatably mounted to the frame and a belt wound on the reel, the reel being rotatable in a belt winding direction to wind the belt on the reel;

a cylinder rotatably mounted to the frame and defining a space, said cylinder having an abutment extending radially to the space;

a rotary piston rotatably mounted to the cylinder and having a vane extending radially into said space and defining with said abutment a chamber;

a pyrotechnic charge in said radial piston, said radial piston having a passage communicating said pyrotechnic charge with said chamber so that said pyrotechnic charge can be ignited to supply pressurized gas to said charge to rotate said cylinder with respect to said piston;

an overrunning clutch connected between said radial piston and said frame for holding said radial piston in a rotatably fixed position when said pyrotechnic charge is ignited to apply pressurized gas to said chamber, and for allowing said radial piston to freely rotate in an opposite direction;

a coupling pulley engageable with said reel with rotation of said coupling pulley in the belt winding direction; and

a tensioning element connected to said cylinder and wrapped around said coupling pulley for rotating said coupling pulley when said pyrotechnic charge is ignited and said cylinder rotates with respect to said piston.

4,558,833

ELECTRICAL CABLE REEL

F. James Speck, 440 W. Alco, Centralia, Mo. 65240

Filed Sep. 10, 1984, Ser. No. 649,272

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—110.1 10 Claims

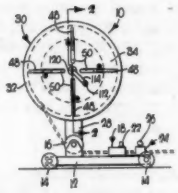
10. A reel for holding a coil of wire or the like comprising:

a support;

a plurality of coil-mounting fingers located in spaced relationship to one another and coupled to said support; and

operating means for said fingers including structure operatively coupled to said fingers and associated with said support for selective, simultaneous radially inward retraction of all of the fingers to a fixable coil loading position, means yieldably biasing said fingers radially outwardly from said coil loading position, and means for selectively releasing said fingers from said coil loading position when the fingers are in said coil loading position for radially outward movement of the fingers under the influence of said biasing means to a coil-engaging position,

said structure incuding a drive pulley coupled to the support, a driven pulley associated with each of said fingers, and a belt interconnecting all of said pulleys,



said releasable means including means for selectively relieving tension on said belt, such that operation of said releasable means enables free rotation of said driven pulleys and allows movement of said fingers under the influence of said biasing means to said coil-engaging position.

4,558,834

YARN TENSION DEVICE

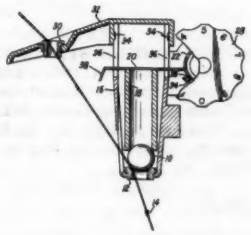
Derek W. Plucknett, Leicester, Great Britain, assignor to Trip Lite Limited, Great Britain

Filed Oct. 4, 1984, Ser. No. 657,665

Claims priority, application United Kingdom, Oct. 8, 1983, 8326992

Int. Cl.[4] B65H *59/24*

U.S. Cl. 242—152.1 2 Claims



1. A yarn tensioning device comprising:

a housing;

an annular seat member supported by the housing;

a ball resting on the annular seat member in contact with an annular seat thereof;

means defining a yarn path through the tensioning device, between the ball and the annular seat;

a torsion spring supported by the housing, the torsion spring comprising a coiled wire spring portion, a torque reaction arm portion at one end of the coiled wire spring portion and engaging the ball for exerting a resilient bias on the ball to urge the ball against the annular seat, and an anchor end portion of the torsion spring at the other end of the coiled wire spring portion; and

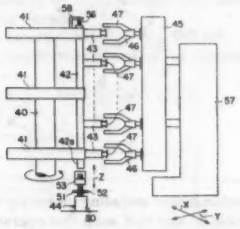
adjustment wheel means supported by the housing and secured to the said anchor end portion of the torsion spring for varying the torsion in the spring.

4,558,835

MULTI-BOBBIN WIRE COILING MACHINE AND JIG MOUNTING MECHANISM THEREFOR

Seiichi Sunaoka, 3570 Oaza Bijogi, Toda-shi, Saitama-Ken, Japan

Filed Jul. 7, 1982, Ser. No. 395,971
Int. Cl.⁴ H01F *41/06*
U.S. Cl. 242—7.09 **8 Claims**



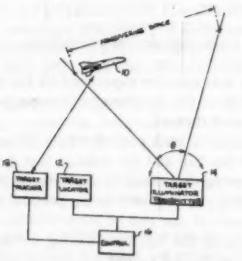
1. A wire coiling machine having flyers, comprising:
an intermittently rotatable vertical rotary shaft,
an indexing jig mounting mechanism mounted on said shaft for rotation together with the shaft,
a plurality of bobbin mounting jigs supported on said jig mounting mechanism in vertically spaced relationship to each other in the longitudinal direction of the jig mounting mechanism, and
a drive means positioned below said jig mounting mechanism adjacent to said flyers to move said jigs vertically;
said indexing jig mounting mechanism comprising a plurality of tables mounted on said shaft in vertically spaced relationship to each other in the longitudinal direction of the shaft and each having a plurality of slots about the periphery thereof, and a plurality of slide plates extending within said slots in the tables and having said jigs secured thereto in vertically spaced relationship to each other in the longitudinal direction of the associated slide plate.

4,558,836

SEMI-ACTIVE CONTROL SYSTEM FOR TRACKING AND ILLUMINATING A TARGET

Peter Kriegesmann, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,664
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230267
Int. Cl.⁴ F41G *7/30*
U.S. Cl. 244—3.11 **12 Claims**



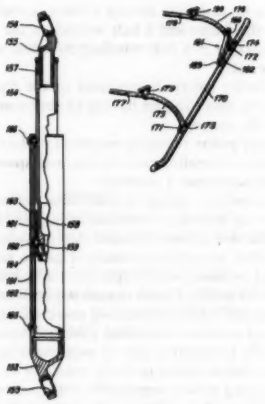
1. A semi-active control apparatus for tracking and illuminating a target which is maneuverable within a maneuvering space comprising at least one target-locating device for periodically renewing information on target location, at least one target illuminating transmitter for only radiating electromagnetic waves in a swingable directive pattern for illuminating a solid angle and being limited by an elevational and azimuthal half width of the electromagnetic waves, the alignment of the directive pattern with the target being effective in accordance with the location of the target determined by said target-locating device, a control connected to said target-locating device and said transmitter for adjusting, if necessary, after every renewed information on the target-location to establish a target directive pattern, the elevational and azimuthal half widths of said directive pattern being at least such that the illuminated solid angle encompasses the maneuvering space of the target within the period of the information renewal of the target locating device.

4,558,837

SKID LANDING GEAR PROVIDED WITH COMPONENTS HAVING A DEVICE FOR ABSORBING ENERGY BY PLASTIC DEFORMATION AND/OR FOR LIMITING STRESS, AND COMPONENTS OF THIS TYPE

Jacques M. N. Mens, Marignane; Pierre Barnoin, Eguilles, and Michel J. L. Martin, Sausset-Les-Pin, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,549
Claims priority, application France, Dec. 8, 1982, 82 20549
Int. Cl.⁴ B64C *27/33*
U.S. Cl. 244—108 **8 Claims**



1. Skid landing gear to be fitted to a helicopter comprising
a pair of crosspieces pivotally mountable to an undercarriage of a helicopter, each crosspiece including a straight central section and a pair of depending leg sections each having a lower end, each crosspiece being pivotable about a first axis perpendicular to a longitudinal axis of the helicopter,
a pair of parallel skids, each being on one side of the helicopter,
means for pivotally attaching said skids to the lower ends of the depending leg sections, each means for pivotally attaching having a pivoting axis parallel to said first axis,
each said depending leg section being inclined relative to vertical having its lower end more rearwardly of the helicopter than its straight central section,
means for absorbing and dissipating energy when acted upon by a force greater than a threshold value by plastic deformation of a component thereof, and
means for pivotally interconnecting said means for absorbing and dissipating energy to at least one of said skids and at least one of said depending leg sections, each means for

pivotally interconnecting having pivoting axes parallel to said first axis,

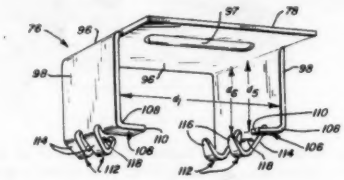
whereby force exerting on the skid landing gear less than said threshold value is taken up by elastic flexion of said depending leg sections and force exerted on the skid landing gear greater than said threshold value is taken up by said means for absorbing and dissipating energy as the skid landing gear rotates and collapses rearwardly.

4,558,838

STORAGE RACK WITH WOOD CROSS BARS AND END BRACKET FOR THE SAME

Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Oct. 30, 1984, Ser. No. 666,343
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—235 **5 Claims**



1. A bracket for the end of one of several wood cross bars that support the shelf decking in a storage rack, said cross bar having:

(i) predetermined maximum and minimum lengths,

(ii) two major surfaces of a predetermined width, and

(iii) predetermined maximum and minimum thicknesses, which end bracket comprises:

(a) a rigid main rectangular plate for overlying contact with one of said cross bar major surfaces with its long dimension oriented transverse to the cross bar, said rectangular plate having a predetermined width sufficiently large that the plate will provide a secure overlying contact with said cross bar end when the cross bar is of its predetermined minimum length;

(b) a thin, flat, rigid, supporting tongue extending rigidly outward from one side of said main rectangular plate for a predetermined distance sufficiently large that said tongue will extend a substantial distance beyond said cross bar end when the cross bar is of its predetermined maximum length;

(c) a rigid flange extending rigidly downward from each end of said main rectangular plate for embracing one of said cross bar ends in a position in which said tongue extends outward from said cross bar a substantial distance beyond the end of the bar;

(d) a rigid finger extending rigidly inward at the bottom of each of said flanges for confining said cross bar end, said finger extending at a relatively small obtuse angle to said flange, with the base of said finger being at a distance from said main rectangular plate substantially equal to said predetermined maximum thickness of said cross bar and the free end of said finger being at a distance from said rectangular plate substantially equal to said predetermined maximum thickness of said cross bar; and

(e) at least one rigid hook member extending inward at the bottom of each of said flanges for fixedly securing said end bracket to said cross bar by driving said at least one hook into the cross bar, each of said hooks having a rigid shank connected at its base to said flange, said shank carrying at its free end a rigid, tapered tip, said tip being rigidly oriented at an acute angle to said shank, the base of said shank being at a distance from said main rectangular plate substantially equal to said predetermined minimum thickness of said cross bar and the free end of said tapered tip being normally at a distance from said main rectangular plate substantially equal to said predetermined maximum thickness of said cross bar,

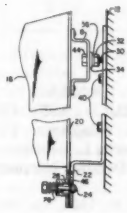
whereby said end bracket can be securely attached to a cross bar of any thickness between said predetermined maximum and minimum thicknesses at any of several positions to accommodate a cross bar of any length between said predetermined maximum length and said predetermined minimum length, and each of said hook tips, which tips are rigidly oriented at an acute angle to their respective hook shanks, can be driven into said wood cross bar ends to embrace a portion of said cross bar within the space encompassed by the tapered tip positioned at said acute angle to its shank.

4,558,839

FACTORY DATA COLLECTION TERMINAL MOUNTED TO A VERTICAL SURFACE BY A QUICK DISCONNECT WALL BRACKET

Jay Kaplan, Wayland, and Ray Marchant, Westboro, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 277,780, Jun. 26, 1981, abandoned.
This application May 23, 1985, Ser. No. 737,894
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—542 **6 Claims**



1. A factory data collection terminal including a quick disconnect wall bracket for mounting said terminal on a vertical surface without removing a cover from said terminal, said terminal comprising:

terminal backplate means fastened to said terminal including a plurality of brackets with keyhold slots; and

wall bracket means fastened to said vertical surface having support means for supporting the weight of said terminal and preventing said terminal from vibrating;

said terminal backplate means including captive screw means threadably engaging said wall bracket means for securely fastening said terminal backplate means to said wall bracket means and providing an indication when said terminal backplate means is free of said wall bracket means; both said terminal backplate and wall bracket means extending below said terminal.

4,558,840

DEVICE FOR MOUNTING A REARVIEW MIRROR CASING ON A SUPPORT MEMBER

Stephane Manzoni, Saint-Claude, France, assignor to Societe Manzoni-Bouchot, France

Filed Mar. 2, 1982, Ser. No. 354,107
Claims priority, application France, Mar. 10, 1981, 81 04764
Int. Cl.[4] A47B *97/04*
U.S. Cl. 248—549 **7 Claims**

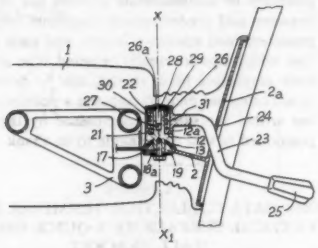
1. A mirror mounting device for pivoting a mirror casing relative to a vehicle body gusset upon impact thereof, said mirror mounting device comprising:

a support member mounted to said vehicle body gusset;

an intermediate member mounted to said mirror casing; and

means for mounting said intermediate member to said support member, said mounting means comprising:

means for pivoting said mirror casing and intermediate member relative to said support member and vehicle body gusset; and



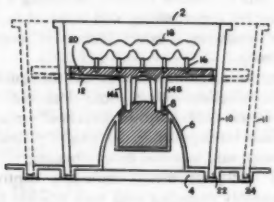
means for selectively adjusting said mirror casing relative to said vehicle body gusset whereby said selectively adjusting means permits selective manual adjustment of said mirror while said pivoting means permits pivoting of said mirror casing relative to said vehicle body gusset upon impact thereof.

4,558,841

SPRUING ASSEMBLY

Melvin A. Engelman, Wappingers Falls; Victor Zamaloff, Poughkeepsie, and Curtis L. Engelman, Wappingers Falls, all of N.Y., assignors to Dentifax International Inc., Wappingers Falls, N.Y.

Filed Feb. 10, 1984, Ser. No. 579,151
Int. Cl.[4] B22C *7/02*; A61C *13/00*
U.S. Cl. 249—54 **12 Claims**



1. A spruing assembly for receiving investment material in the production of an investment mold for castings comprising:

a base member,

said base member including a centralized sprue base former,

a feeder bar,

hollow sprue means supporting said feeder bar,

said bar being open at its top and having a narrow channel sloping downwardly from each end of said bar toward said hollow sprue supporting means for conducting molten wax into said hollow sprue supporting means,

a wax pattern of a part to be cast,

wax means added to said narrow channel,

pattern supporting means engaged by said wax means for supporting said wax pattern,

said sprue base former including means for supporting said hollow sprue means, and

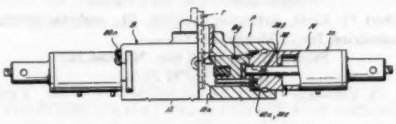
a ring member engaging said base member and surrounding said feeder bar so as to form a hollow chamber for receiving said investment material.

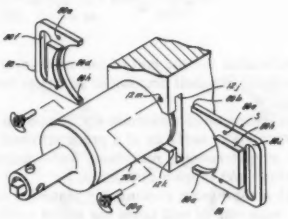
4,558,842

CONNECTOR FOR JOINING BLOWOUT PREVENTER MEMBERS

Archie W. Peil, and Arnal B. Foreman, Jr., both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Continuation of Ser. No. 529,383, Sep. 6, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,044
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 **6 Claims**





1. A blowout preventer for attachment to a tubular member of a well for containing pressures within the well, comprising:

a body adapted to be mounted with the tubular member, said body formed having an axial bore therein and adapted to be positioned in substantial axial alignment with the tubular member of the well, said body having a ram bore therein, said ram bore substantially perpendicular to and intersecting the longitudinal axis of said axial bore, said body having a slot therethrough, said slot being in a plane substantially perpendicular to the axis of said ram bore;

a ram actuator body member releasably mounted with said body, said ram actuator body member having a circumferential groove extending around the entire circumference of said ram actuator body and adapted to be aligned with said slot for mounting and disconnecting said ram actuator body member from said body;

securing means including two plates each of which is of substantially the same width as said slot for slidable mounting in said slot and in said groove, and with both plates in the same plane, said plates having a leading arcuate end whose radius is at least equal to the radius of said circumferential groove measured at the longitudinal ram actuator body surface within said groove, to extend into and to engage said circumferential groove of said actuator body member substantially around its entire circumference to mount said ram actuator body member with said body; and

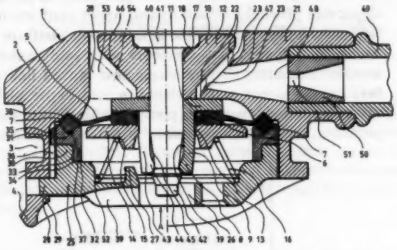
said securing means also including securing members removably mounted with said body and said plates for releasably connecting said ram actuator body member with said body.

4,558,843

AIR INLET VALVE FOR ADMITTING AIR TO THE MILK DRAIN CONDUIT OF A TEAT CUP OR COLLECTOR PIECE

Tilman Hoefelmayr, Niederteufen, Switzerland, assignor to Biomelktechnik Hoefelmayr & Co., Niederteufen, Switzerland

Filed Jul. 6, 1984, Ser. No. 628,189
Claims priority, application European Pat. Off., Jul. 19, 1983, 83107075.0
Int. Cl.⁴ F16K *31/145*
U.S. Cl. 251—61 **20 Claims**



1. An air inlet valve for selectively supplying air to a milk discharge conduit of a milking device, comprising: a housing adapted to be supported on the milking device, said housing having thereon an opening therein, having a surface which serves as a valve seat, and having a passageway therein which opens through said valve seat; a diaphragm which extends across said opening in said housing and has its peripheral edges sealingly clamped on said housing, said housing having means for providing fluid communication between a first portion of said opening on a first side of said diaphragm and atmospheric air surrounding said air inlet valve and having means for providing fluid communication between a second portion of said opening on a second side of said diaphragm and an interior region of the milking device; a valve poppet secured to said diaphragm so as to project from said first side thereof into said first portion of said opening in said housing, pressure decreases and increases in the interior region of the milking device causing said diaphragm to flex and to move said valve poppet between positions in which it is respectively engaging said valve seat so as to directly close and obstruct fluid flow through said passageway and spaced from said valve seat so as to permit fluid flow through said passageway; and a connecting conduit which provides direct fluid communication between the milk discharge conduit and said passageway in said valve seat.

4,558,844

DIRECT ACTING VALVE ASSEMBLY

William R. Donahue, Jr., West Lafayette, Ind., assignor to Appliance Valves Corporation, West Lafayette, Ind.

Filed Apr. 11, 1985, Ser. No. 722,170
Int. Cl.⁴ F16K *47/00*
U.S. Cl. 251—118 **10 Claims**

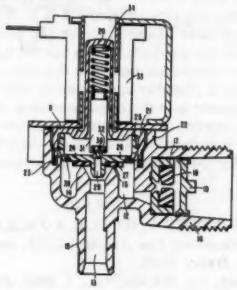
1. A direct acting valve assembly which comprises:

a valve body having an annular inlet and an outlet centrally located relative to the inlet, said body including an annular surface between the outlet and the inlet and defining a sealing seat for said valve body;

a guide tube secured to said valve body, said guide tube defining a guide cylinder aligned coaxially with the annular inlet and with the annular surface of said valve body;

an annular seal positioned adjacent the annular surface of said valve body, said seal including a central opening aligned and communicating with the outlet of said valve body;

a stationary insert secured to one of said valve body and said guide tube, said insert including an annular surface positioned adjacent said annular seal and providing a fluid tight seal between said insert and the annular surface of said valve body, said insert including a central aperture aligned and communicating with the central opening of said annular seal and with the outlet of said valve body, said insert also defining at least one inlet aperture extending through said insert from a first side located in communication with the inlet of said valve body to a second side in a location communicable with the central aperture on the side opposite said annular seal, said insert further defining an upraised, valve seat on the side of said insert opposite said annular seal, the valve seat being generally coaxial with the central aperture and the central aperture extending therethrough;



a closure member received and reciprocal within the guide cylinder of said guide tube;

a valve seal positioned on the end of said closure member facing the valve seat of said insert;

said closure member having a first position with said valve seal displaced from the valve seat of said insert allowing fluid to flow from the inlet of the valve body, through the inlet aperture of said insert and thereafter through the central aperture of said insert to the outlet of said valve body, said closure member having a second position with said valve seal positioned adjacent the valve seat of said insert preventing flow of fluid through the central aperture of said insert; and

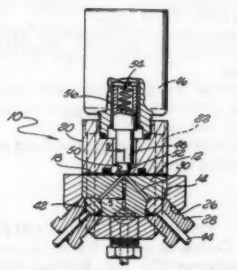
means for moving said closure member between the first and second positions to open and close the valve assembly.

4,558,845

ZERO DEAD VOLUME VALVE

Michael W. Hunkapiller, 3514 Grayburn Rd., Pasadena, Calif. 91107

Filed Sep. 22, 1982, Ser. No. 421,445
Int. Cl.⁴ F16K *7/14*
U.S. Cl. 251—331 **7 Claims**



1. A zero dead volume valve for controlling the flow of a fluid including a valve block having at least one substantially flat valving site on a surface thereof, said valve block defining a plurality of linear passages therein communicating with the valving site through openings, said passages being free of

intersections within said valve block, at least two of said passages intersecting at the surface of said valve block at said valve site, at least one other of said passages terminating at the surface of said valve block at a point on said valve site which is spaced apart from where said two passages intersect, a resilient diaphragm covering said valving site and forming a fluid tight seal with said valve block along the periphery of the valving site, and a closure element having a substantially flat closure surface, said closure element being actuable between an open condition wherein said closure surface is retracted a preselected distance from said valving site and diaphragm, and a closed condition wherein said closure surface forces said diaphragm against the valving site; whereby the diaphragm can be urged away from the valving site by fluid pressure in the passages when the closure element is in the open condition, establishing a valve chamber above the valving site for fluid flow between the passages, and is forced against the valving site when the closure element is in the closed condition, eliminating the valve chamber and expelling any fluid therein and, when said closure is in the open condition, there is fluid communication between all passages at said valve site and, when said closure is in the closed condition, there is fluid communication only between said intersecting passages.

4,558,846

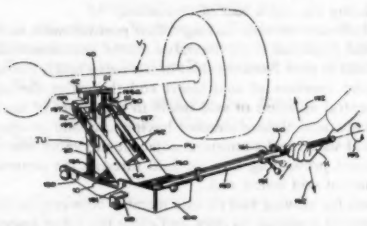
MOBILE POWER UNIT FOR A JACKING SYSTEM

Harry H. Arzouman, Los Angeles, Calif., assignor to Safe-T-Jack, Inc., Irvine, Calif.

Division of Ser. No. 261,686, May 7, 1981, Pat. No. 4,462,569. This application Jun. 20, 1984, Ser. No. 622,869

Int. Cl.⁴ B66F *5/04*

U.S. Cl. 254—8 B **13 Claims**



1. An easily transportable power unit adapted to be used in conjunction with an extendible jack stand having top and bottom plates supported on upper and lower telescoping vertical frames, for selective attachment to the jack stand and when thus attached to selectively raise or lower the jack stand, said power unit comprising, in combination:

two vertically spaced pairs of horizontally separated arms adapted to straddle said telescoping vertical frames intermediate to said plates for supportingly engaging corresponding ones of said plates;

power means selectively operable to expand the vertical spacing between said pairs of arms to thereby extend the jack stand;

actuating means operable when said pairs of arms are in expanded position for actuating a ratchet release on the jack stand; and

means for manually controlling both said power means and said actuating means.

4,558,847

PATIENT LIFTING TABLE

Simon T. E. Coates, Redbank Plains, Australia, assignor to Coates Management Pty. Ltd., Redbank Plains, Australia

Continuation-in-part of Ser. No. 313,086, Oct. 20, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,580

Claims priority, application Australia, Oct. 22, 1980, PE6168

Int. Cl.⁴ B60P *1/48*

U.S. Cl. 254—9 C **6 Claims**

1. A veterinary table comprising:

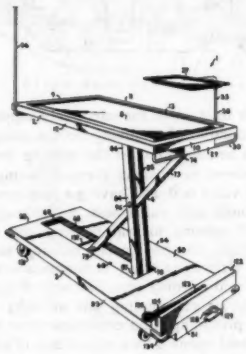
(a) an upper platform having a planar, patient supportive upper surface and an underside including track means;

(b) a lower platform positioned below and aligned with said upper platform and having a generally planar, obstruction free upper surface for said upper platform to rest upon and an underside;

(c) wheels mounted to said lower platform for movement over a floor surface;

(d) a track means mounted in said lower platform underside;

(e) a scissor linkage mechanism extending between and connected to said upper and lower platforms to provide straight upward and downward movement of said upper platform relative to said lower platform; said scissor linkage mechanism including a center link member having an upper end pivotally affixed to said upper platform underside and a lower end slidable in said lower platform track means, and spaced link members with said center link member extending therebetween; said spaced link members having upper ends slidable in said upper platform track means and lower ends pivotally affixed to said lower platform underside; said center link member and said



spaced link members having pivotally interconnected mid-portions;

(f) said lower ends of said spaced link members being mounted below said lower platform upper surface and having bell crank arms extending angularly thereform and supporting a rod extending transversely between said bell crank arms;

(g) a power fluid ram mounted in said lower platform and aligned with said lower platform track means, said ram having one end pivotally connected to said lower platform and a second end pivotally connected to said rod, said rod being extensible and retractible to cause upward and downward swinging of said spaced link members and raising and lowering of said upper platform; said ram being mounted entirely below said lower platform upper surface for concealment and whereby said upper platform may rest against said lower platform; and

(h) a manual pump and relief valve mounted on said lower platform adjacent said ram.

4,558,848

JACK ADAPTER

Thomas M. Rutter, Elkhart, Ind., assignor to Fab-Form Products, Inc., Elkhart, Ind.

Filed Jun. 25, 1984, Ser. No. 624,401

Int. Cl.⁴ B66F *3/36*

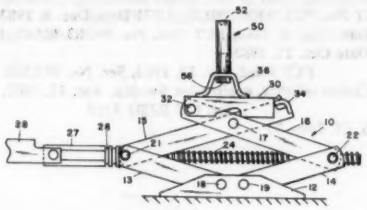
U.S. Cl. 254—100 **7 Claims**

1. An adapter for elevating a vehicle for changing tires when said vehicle includes a running board extending between a jack supporting member and the ground comprising:

an adapter rod for extending in a generally vertical direction from a jack, said adapter rod comprising a substantially solid rod having a threaded aperture at one end; said adapter rod further including a jack support member

receiving recess formed at an end opposite said threaded aperture;

means for removably securing said adapter rod to a jack comprising a bolt for extending through a support plate on a jack into said threaded aperture of said adapter rod; and



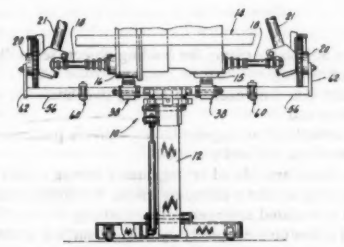
a running board including aperture means formed in said running board for receiving said adapter rod, said aperture formed in vertical alignment below the jack supporting member of the vehicle whereby said adapter rod couples the jack to the jack support member through said running board.

4,558,849

SUPPORT FOR THE DRIVE COMPONENTS OF A FRONT WHEEL DRIVE VEHICLE

Alan R. Luening, St. Francis, and Robert A. Borkowski, Brookfield, both of Wis., assignors to Applied Power Inc., Brookfield, Wis.

Filed Jan. 31, 1984, Ser. No. 575,697
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—134 **8 Claims**



1. A support for the drive components axles and wheel hubs of a front wheel drive vehicle;

said support including a frame adapted to be connected to a lifting device,

spaced apart first and second support means mounted on the frame for supportingly engaging spaced apart portions of the drive components,

third and fourth support means extending laterally from said frame,

a pair of arm means pivotally mounted on horizontally spaced apart portions of the frame and including means for releasably securing the frame to the hubs and axles coupled to the drive components,

first and second pivot means respectively supporting said arm means for pivotal movement, said pivot means being mounted respectively on said third and fourth support means for movement thereon toward and away from each other,

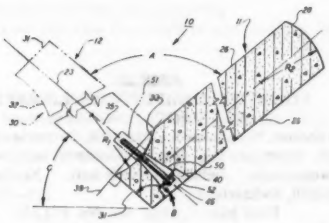
each arm includes a first portion extending generally horizontally relative to said frame and being connected at one end to said pivot means for pivotal movement about a generally vertical axis and a second portion spaced from the pivot means and extending generally upwardly from said first portion, said second portions being spaced apart a distance greater than that between the wheel hubs of said vehicle when said pivot means are adjacent the remote ends of said third and fourth support means, said second portions each having an aperture adjacent the upper end thereof and spaced above said first and second support means a distance equal to that of the wheel hubs from the spaced apart portions of the drive components when said components are supported by the first and second support means, said apertures being constructed and arranged for receiving a vehicle wheel lug so that the second portion of each arm can be secured to one of the wheel hubs of the vehicle.

4,558,850

NOISE BARRIER

Nicholas W. Melfi, Manlius, N.Y., assignor to Concrete Pipe & Products Corp., E. Syracuse, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,102
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—24 **8 Claims**



1. In a noise barrier of the type having a series of vertically disposed concrete panels placed in end to end abutment to form a serpentine wall, said barrier including

a rectangular panel having a pair of parallel side walls and a pair of opposed end walls

a first end wall having a vertically disposed curved surface with the radius of curvature lying on the horizontal axis of the panel

a second end having a pair of contiguous vertically disposed surfaces that includes a planar surface that intersects one side wall of the panel to form an obtuse angle therewith and a concave surface that intersects the other side wall of the panel

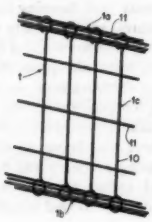
said concave surface having a chord that forms a right angle with the planar surface and the length of chord being equal to the thickness of the panel whereby the radius of curvature of the concave surface lies on an axis that is parallel to the planar surface.

4,558,851

FENCE OF WIRE LATTICEWORK

Kiyoshi Nakayama, Takamatsu, Japan, assignor to Asahi Wire Nets & Steel Ltd., Kagawa, Japan

Filed Jun. 16, 1982, Ser. No. 389,363
Int. Cl.[4] E04H *17/16*
U.S. Cl. 256—24 **24 Claims**



1. A fence of wire latticework, comprising a plurality of lattice bodies, a plurality of supports for supporting some of

the lattice bodies laterally one from another and for supporting some of the lattice bodies in superimposed relation to each other; and connecting means for connecting said lattice bodies to the supports, and lattice bodies each being composed of a plurality of vertical wire members and a plurality of horizontal wire members, said vertical members in each lattice body being curved at their upper ends to form respective circular portions, and a group of horizontal members in each lattice body being arranged within the respective circular portions and connected thereto so as to form a respective upper cylindrical part of the respective lattice body.

4,558,852

VIBRATION DAMPER WITH LINEARLY RECIPROCATING MASS

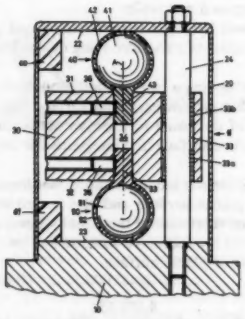
Heinz Steiner, Neuhausen am Rheinfall, Switzerland, and Fritz Knoll, Konstanz, Fed. Rep. of Germany, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 2, 1983, Ser. No. 471,534

Claims priority, application Switzerland, Mar. 11, 1982, 1506/82

Int. Cl.⁴ F16F *15/08*

U.S. Cl. 267—137 **6 Claims**



1. A vibration damper comprising

(a) a housing defining a cavity;

(b) two opposite wall surfaces bounding said cavity;

(c) a damping mass accommodated in said cavity between said wall surfaces and arranged for oscillating along a path within said cavity; said damping mass having two opposite sides and a central axis generally parallel with said path;

(d) a single spring element situated on each said side of said damping mass; each said spring element being in engagement with said damping mass and a respective one of said wall surfaces for positioning said damping mass in said cavity; each said spring element having a shape approximating a sphere and being an elastomer having a low inherent damping property and high rebounding elasticity; each said spring element being symmetrically arranged with respect to said central axis of said damping mass; and

(e) sliding guiding means defining a linear track arranged parallel to and spaced from said central axis for guiding said damping mass linearly along said path.

4,558,853

ADJUSTABLE CLAMP FOR HOLDING OBJECTS SECURELY IN POSITION

Tommy Janerstal, Ellös, and Sven H. Yngvesson, Floda, both of Sweden, assignors to Partille Tool Aktiebolag, Partille, Sweden

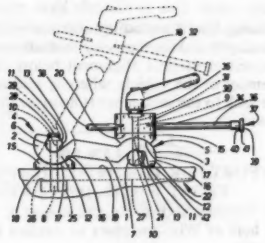
PCT No. PCT/SE83/00133, § 371 Date Dec. 8, 1983, § 102(e) Date Dec. 8, 1983, PCT Pub. No. WO83/03567, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 12, 1983, Ser. No. 567,859

Claims priority, application Sweden, Apr. 13, 1982, 8202296

Int. Cl.⁴ B23Q *3/18*

U.S. Cl. 269—71 **4 Claims**



1. An adjustable clamp for holding objects securely in position, comprising:

at least one arm, each arm having two hook-like end portions; and

two articulated arrangements respectively positioned at said two hook-like end portions;

one of said articulated arrangements having means for connecting thereto a clamping means for holding the object;

each articulated arrangement comprising:

(a) a first convex, partly cylindrical surface at the respective end portion;

(b) a second, concave, partly cylindrical surface at the respective end portion and spaced from said first surface; said two surfaces being coaxial with each other;

(c) a first pivot pin having a third, cylindrical surface in contact with and slideable with respect to said second surface;

(d) a body having:

(1) a fourth concave, partly cylindrical surface coaxial with said first and second surfaces, and

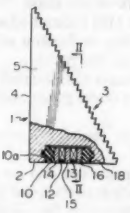
(2) a fifth, flat surface in contact with and turnable relative to a corresponding sixth, flat surface; said first surface being in contact with and slideable relative to said fourth surface;

(e) a second pin extending through the respective hook-like end portion and said body essentially at right angles to said first pin, and forming a pivot axis for said fifth surface relative to said sixth surface, and also forming locking means adjustable between a first position for locking the end portion, pins and surfaces relative to each other in selected positions of said arm, and a releasing position in which said end portion, pins and surfaces are movable relative to each other, and vice versa; one end portion being open in one direction, and the other end portion being open in a direction opposite to said one direction.

4,558,854
STEP BLOCK

Masakazu Suzuki, Ibaraki, Japan, assignor to Suzuki Iron Works Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,761
Claims priority, application Japan, Jun. 6, 1983, 58-86237[U]
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 269—93 2 Claims



1. A step block including a base surface portion and a sawteeth portion which is inclined generally at an angle of 60 degrees to the base surface portion and has a plurality of teeth, each of the same dimensions and each having a first surface which is inclined upwards and outwards by about 10–15 degrees relative to a plane parallel to the base surface portion and a second surface which is inclined upwards and outwards by 10–15 degrees relative to a plane being perpendicular to the base surface portion, thereby forming a tooth angle of about 65 degrees,

the improvement comprising:

a recess means being formed on the base surface portion and having a circumferential wall with two pairs of opposite sides;

at least one permanent magnet arranged in the recess means;

at least two yokes of magnetic material interposing the at least one permanent magnet between them, contacting said at least one permanent magnet, and extending in contact between one of the two pairs of opposite sides of the recess means, said at least two yokes having bottom surfaces coplanar with the bottom surface of the base surface portion;

resin means for securing the at least one permanent magnet and the at least two yokes in the recess means; and

at least one means, formed in the circumferential wall of the recess means, for increasing the adherence between the resin means and the recess means.

4,558,855
DEVICE FOR COMPRESSING ARTICLE HOLDING RACKS

Richard J. Kellerman, 4160 Fruitville Rd., #28, Sarasota, Fla. 33582, and Clifford L. Beal, 209 N. Briggs Ct., Sarasota, Fla. 33577

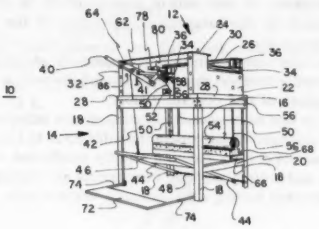
Filed Oct. 28, 1983, Ser. No. 546,657
Int. Cl.⁴ B25B *1/16*
U.S. Cl. 269—158 10 Claims

1. A device for simultaneously compressing a longitudinal row of resilient finger pairs on an article holding rack, the free ends of the fingers of each finger pair being mutually compressible to receive and retain an article, comprising:

(a) a fixed plate-like jaw mounted in a horizontal plane;

(b) a moveable plate-like jaw mounted for movement in the same plane as said fixed jaw between a position adjacent to the edge of said fixed jaw and a position horizontally displaced from said fixed jaw;

(c) a first rack end support mounted for movement below said horizontal plane between a position below the edge of said fixed jaw and a position displaced therefrom less than the displacement of said moveable jaw from said fixed jaw;



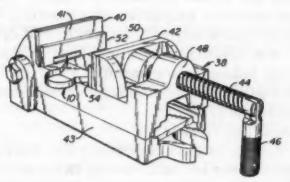
(d) means for moving said moveable jaw and said first rack support between their two positions;

(e) means for adjusting the height of said first rack support.

4,558,856
HOLDER FOR VISE PARALLELS

Robert H. Shaffer, 1103 Burgoyne St., Mountain View, Calif. 94043

Filed May 29, 1984, Ser. No. 614,369
Int. Cl.⁴ B23Q *3/06*
U.S. Cl. 269—277 8 Claims



1. A holder for retaining a pair of parallels against the jaws of a vise comprising:

a body of spring material having a pair of elongated sides, each side having an outer end, said sides being movable toward and away from each other, the body having means biasing the sides away from each other; and

an end member for the outer end of each side, respectively, there being means pivotally mounting each end member intermediate its ends on the outer end of the respective side, said pivot means including a pair of aligned tabs on the outer end of each side, respectively, each end member having a pair of holes therethrough for receiving the tabs of a respective side, each end member having a flat face for engaging a parallel to urge the parallel against the respective jaw of a vise when the body and end members are in the space between the vise jaws.

4,558,857
OPERATING TABLE

Rudolf Heller, Zürich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jan. 31, 1983, Ser. No. 462,427
Claims priority, application Switzerland, Feb. 19, 1982, 1035/82
Int. Cl.⁴ A61G *13/00*
U.S. Cl. 269—325 10 Claims

1. An operating table, in particular for microsurgery, comprising:

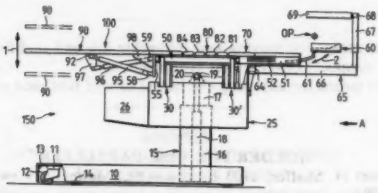
an elevationally adjustable standard;

a supporting frame carried by said standard;

a patient rest structure supported by said supporting frame;

first adjusting means for effecting a first pivoting movement

of said patient rest structure in a direction oriented transversely with respect to said operating table;
second adjusting means for effecting a second pivoting movement of said patient rest structure in a direction oriented in the longitudinal direction of the operating table;
said patient rest structure being pivotable about a surgical operating location disposed substantially within a symmetry plane of said operating table;
said first and said second adjusting means being structured and arranged at said operating table so as to leave the site of said operating location largely unaffected when said first and second pivoting movements are carried out;
said standard having a substantially vertical axis;



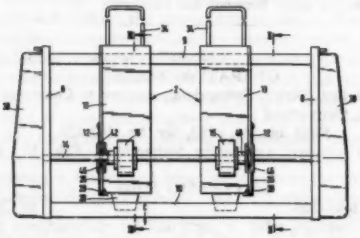
said first adjusting means being structured to accomplish a compound translatory displacement thereof relative to said axis of said standard, in order to enable said patient rest structure including said supporting frame to be pivoted transversely with respect to said operating table;
said first adjusting means including at least one parallelogram linkage arrangement;
each said parallelogram linkage arrangement including:
a number of links;
a connecting element;
said number of links comprising first links arranged behind one another and each having two ends; and
said first links each being connected to said supporting frame at one of said two ends thereof and to said connecting element at the other one of said two ends thereof.

4,558,858

SHEET SUPPLY APPARATUS FOR TYPEWRITERS, HAVING SLEWING ROLLERS ENGAGING A PLATEN ROLL, AND METHOD

Kurt Rünzi, Küsnachterstrasse 59, CH-8126 Zumikon, Switzerland

Filed Sep. 29, 1983, Ser. No. 536,862
Claims priority, application Switzerland, Oct. 12, 1982, 5957/82
Int. Cl.⁴ B65H *3/32*
U.S. Cl. 271—22 **20 Claims**



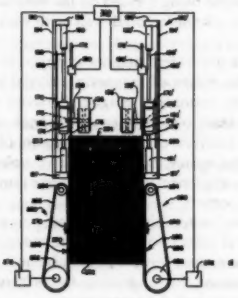
1. Single-sheet feed apparatus for office-type automatic writing machines, having
a frame (8, 10) including spaced side elements (8),
a rotatable shaft (14) and at least two feed rollers (15) rotatable with said shaft,
and comprising
an assembly including
two parallel rockers (2, 12) having a support surface (13);
a common shaft (9) extending between the side elements (8) and securing the rockers thereon for common rocking movement about the axis of the shaft, upon rocking movement of said shaft, while permitting axial shifting movement of the rockers on the shaft;
an abutment element (18) located adjacent the end of each rocker at the leading or feeding edge of the sheets and axially movable with the rockers;
sheet separating elements (28) located adjacent the corners of the leading edges of the sheets and axially movable with the rockers;
wherein the rotatable shaft (14) extends parallel to said common shaft (9);
and engagement elements (46, 48) are provided coupled to move with the support surfaces of the respective rockers and moving the respective feed rollers axially along the rotatable shaft (14)
upon axial shifting of the respective rockers.

4,558,859

STACK TOP CONTROL METHOD AND APPARATUS

B. Michael Duke, Plattsburgh, and Edward L. Kempisty, Rouses Point, both of N.Y., assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Mar. 15, 1984, Ser. No. 590,027
Int. Cl.⁴ B65H *31/10*
U.S. Cl. 271—200 **10 Claims**



9. A method for substantially leveling a top of a stack of sheet materials on a stacking platform, said method comprising the steps of:
(a) sensing the vertical position of two spaced apart locations on a top of said stack;
(b) comparing the vertical position of said two spaced apart locations;
(c) providing a frictional drive force tangentially engaging a side of said stack on said stacking platform; and
(d) varying the amount of drive force responsive to said compared vertical positions of said two spaced apart locations, said drive force reducing a difference in vertical position between said two spaced apart locations.

4,558,860

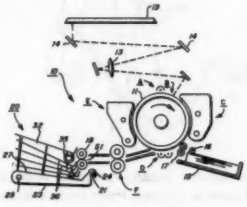
SINGLE PIVOT BIN SORTER

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1984, Ser. No. 615,005
Int. Cl.⁴ B65H *39/11, 31/24*
U.S. Cl. 271—293 **10 Claims**

1. Sorting apparatus comprising a support frame, a nest of a

plurality of sheet receiving bins, each bin with a sheet output end at one end thereof and an input end at the other end thereof, each of said plurality of bins being pivotally mounted at its output end about the same pivot point on said support frame such that the output end of each bin is at a level higher than its input end so that the bins slope upwardly from the input end to the output end thereby providing uphill stacking of individual sheets as they are inserted in each of the bins, said bins being spaced relatively close together at the input end and being spaced relatively far apart at the output end, means to



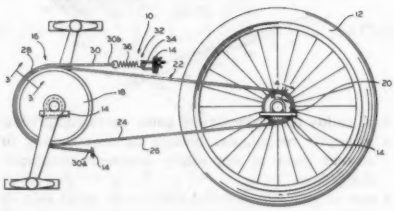
sequentially pivot the bins about their mounting pivot and index the input end of each of said bins past a fixed sheet feed throat to facilitate insertion of a sheet into each bin, said indexing means sequentially moving said bins from one side of the feed throat to a position opposite the fixed sheet feed throat to the other side of the feed throat, said indexing means widely spacing apart adjacent said bins to provide a sheet entry for successive bins when positioned opposite said fixed feed throat, said input ends of said bins being nested close together on either side of said sheet entry.

4,558,861

DRIVE SYSTEM FOR EXERCISE APPARATUS OR THE LIKE

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

Filed May 11, 1984, Ser. No. 609,284
Int. Cl.[4] A63B *69/16, 21/00;* **F16D** *51/00, 51/02*
U.S. Cl. 272—73 **16 Claims**



1. A drive system, comprising:

a rotatable member mounted on a frame together with means for rotating the rotatable member;

a drive pulley operatively associated with the rotating means and a driven pulley operatively associated with the rotatable member;

a belt member drivingly interconnecting the drive and driven pulleys, the belt member imparting rotation of the rotating means to the rotatable member through the drive and driven pulleys, the belt member having an inner surface in driving engagement with the driven and driven pulleys; and

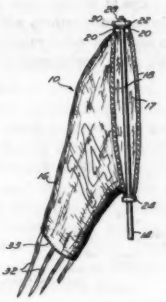
means for frictionally engaging an outer surface of the belt member, the frictional engagement means engaging the outer surface of the belt member in the area in which the inner surface of the belt member is in driving engagement with the drive pulley, the frictional engagement means imparting a resistance to rotation of the rotating means.

4,558,862

GOLF PIN SOCK

Jason S. Kelly, 3430 Laketree Dr., Fallbrook, Calif. 92028

Filed Apr. 2, 1984, Ser. No. 595,623
Int. Cl.[4] A63B *57/00;* **G09F** *17/00*
U.S. Cl. 273—34 R **8 Claims**



1. An improved golf pin flag device comprising:

a golf pin comprising a staff for marking the location of a hole in a golf green;

a frusto-conical shaped tubular member having a large open end and a small open end positioned upon said golf pin and adapted to be disposed to wind;

means positioned adjacent said large end of said tubular member, said means comprising a pair of elongate members formed of a sufficiently resilient material to maintain said large end of said tubular member in a first open position and selectively permit said large end of said tubular member to extend into a second open position, larger than said first open position and porportional to the increased wind speed periodically impinging upon said tubular member; and

a pair of bearings rotatably mounted to said golf pin, each adapted to capture opposite ends of said pair of elongate members to attach said tubular member to said golf pin, one of said pair of bearings further being mounted to said golf pin to permit axial reciprocation of said one bearing during extention of said large end of said tubular member from said first to said second open position.

4,558,863

GOLF CLUB SHAFT

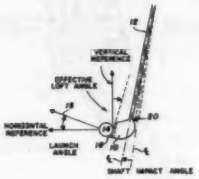
Steven L. Haas, Greer, S.C., and William Gobush, North Dartmouth, Mass., assignors to Acushnet Company, New Bedford, Mass.

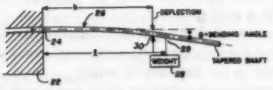
Continuation of Ser. No. 222,080, Jan. 2, 1981, abandoned. This application Jun. 8, 1982, Ser. No. 386,439
Int. Cl.[4] A63B *53/12*
U.S. Cl. 273—77 A **7 Claims**

1. A method for making a stepped cylindrical golf club shaft of a desired material having a predetermined portion configured to achieve a predetermined shaft impact angle for a predetermined shaft flexibility for wood or iron type golf clubs, said predetermined portion lying within a middle portion of the shaft, said predetermined portion beginning no less than 10 inches from the grip end and ending at a point no less than 14 inches from the tip end of the golf club shaft comprising the steps of:

(a) selecting the length of said predetermined portion and the lengths of the portions of the shaft outside said predetermined portion;

(b) selecting a predetermined number of sections for the stepped golf club shaft outside the said predetermined portion and the lengths thereof;
(c) selecting the number of steps to be included in said predetermined portion;
(d) selecting the outer diameters and wall thicknesses of each section of the golf club shaft including the sections of said grip end, said tip end and said predetermined portion;
(e) dividing said predetermined portion into a plurality of equal segment lengths;
(f) determining from among the plurality of all combinations of steps or no steps at all the ends of each said segment, respectively, those combinations which have a configuration which has the selected number of steps;
(g) calculating, for each configuration having said selected





number of steps, the deflection at a preselected point when a load is applied at another preselected point of a golf club shaft having such configuration, according to a first selected mathematical equation;
(h) selecting each of those configurations which have deflections within a desired predetermined range of deflections;
(i) determining, according to a second selected mathematical equation, at the point where deflection is calculated the slope of the bending angle of the shaft of each configuration with said desired predetermined range of deflections;
(j) selecting a configuration having the desired slope from among the plurality of configurations within said desired predetermined range of deflections; and
(k) making a golf club shaft with the middle portion configured in accordance with the configuration selected in step j.

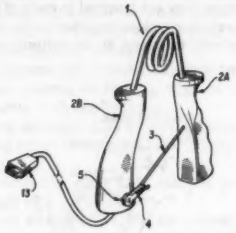
4,558,864

HANDGRIP EXERCISING, COMPUTER GAME CONTROLLER

Marion C. Medwedeff, 213 Brandywyne, Friendswood, Tex. 77546

Filed Jun. 13, 1984, Ser. No. 620,384
Int. Cl.⁴ A63F *9/22*
U.S. Cl. 273—148 B **5 Claims**

1. A computer game and control device and exercise apparatus which comprises:
a pair of elongated handles to be gripped by the hand throughout the width of the hand,
means mounting the handles together for movement of the handles toward each other in pivotal movement about a pivot axis that is disposed longitudinally beyond the handles whereby the whole body of the hand grip is disposed beyond the pivot axis,
the mounting means including spring means biasing the handles apart and yielding to enable the handles to be moved toward each other and the spring means being of sufficient strength whereby the handles can be moved in contact with each other only by exerting the full strength of the hand,
an electrical switching device mounted in one of the handles,
means mounted on the handles for actuating said switching device when said handles are pressed towards each other,



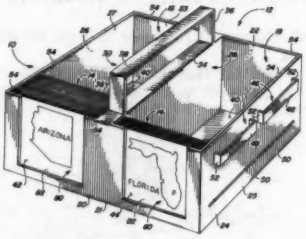
a signal transmission means coupled with said switching device to transmit a signal from said switching device to a computer, so that when the handles are moved towards each other a signal proportional to the distance between the handles may be transmitted from the handles to a computer.

4,558,865

KNOWLEDGE GAME APPARATUS AND METHOD AND CARD CADDY THEREFOR

Charles B. Isgar, 1014 S. Ogden, Denver, Colo. 80209

Filed Oct. 26, 1984, Ser. No. 665,349
Int. Cl.⁴ A63F *1/04, 1/10*
U.S. Cl. 273—148 A **19 Claims**



9. A caddy for a plurality of game cards comprising:
a generally rectangular bottom member having first and second pairs of oppositely disposed peripheral edges thereof;
a pair of generally parallel and spaced apart side members having respective lower edges thereof affixed to said first pair of said peripheral edges, said side members extending generally perpendicularly therefrom to respective upper edges thereof;
first and second generally parallel and spaced apart end members abutting said side members, said end members having respective lower edges thereof affixed to said second pair of oppositely disposed peripheral edges, said end members extending generally perpendicularly therefrom to respective upper edges thereof, said first end member having a window therein communicating with said upper edge thereof; and
a cover member affixed to at least said side member upper edges, said cover member having end portions thereof being noncontiguous to said first and second end member upper edges forming respective first and second card slots therewith
whereby said game cards may be inserted into said second

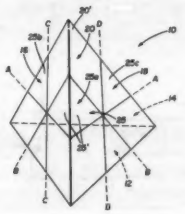
card slot and removed from said first card slot by digital manipulation of at least one of said plurality of game cards through said window.

4,558,866

REGULAR POLYHEDRON-BASED LOGICAL PUZZLES

William L. Alford, 5775 Pindell Rd., Lothian, Md. 20820

Filed Aug. 14, 1981, Ser. No. 293,321
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S 15 Claims



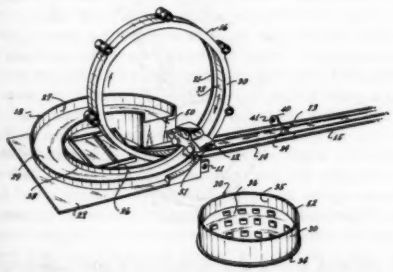
12. A polyhedral puzzle comprising: an assemblage of elements each provided with at least one outwardly exposed indicia-bearing planar face; means maintaining said elements together in a solved configuration of said assemblage defining a polyhedron with each face of said polyhedron constituted by a plurality of said element faces having a prescribed indicia array, and means permitting groups of said elements to be rotated about at least four non-orthogonal axes of said polyhedron such that said faces of said rotated elements constitute portions of other ones of said polyhedron faces, said rotations resulting in the interchanging of said elements among said groups thereof and disordered arrays of indicia on the faces of said polyhedron.

4,558,867

TOY VEHICLE TRACKWAY SET

Keith A. Hippely, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1983, Ser. No. 566,594
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—412 4 Claims



1. A toy vehicle trackway set for use in combination with a miniature toy vehicle in which said toy vehicle is accelerated through a multiply-curved track and launched therefrom in a skill game wherein a player attempts to predict the resulting flight of said launched toy vehicle, said toy vehicle trackway set comprising;

an elongated straight track, said straight track having a substantially flat race surface extending the length thereof, a pair of wall portions substantially perpendicular to said race surface and extending the length of said race surface to define a track channel having a generally U-shaped cross section, and first coupling means at one end;

a track loop, having a track channel having a cross section substantially similar to that of said straight track portion, formed in an open loop configuration in which said track channel traverses the interior portion of the loop thus formed-and having second and third coupling means at opposite ends of said track loop;

a base member having a substantially planar undersurface and an upper surface defining a ramp portion raised from said upper surface having formed therein a track channel having a cross section substantially corresponding to that of said straight track portion and defining an entrance point an exit point and a generally upwardly sloping curved path therebetween such that a toy vehicle entering said ramp portion is thereby raised from a first lesser height to a second greater height, undergoes a change in direction and is launched from said exit point;

said base member further defining fourth coupling means at said entrance point and fifth coupling means adjacent said entrance point, said fourth and fifth coupling means to retain said track loop in a substantially vertical position and forming a helical path, and sixth coupling means aligned with said fifth coupling means and cooperating with said first coupling means to retain said straight track in alignment with said track loop;

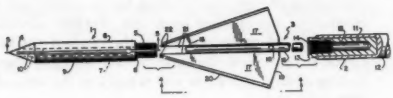
and vehicle receiving means freely moveable with respect to said base member and defining an upwardly facing receiving cavity for a toy vehicle.

4,558,868

ARROWHEAD WITH INTERCHANGEABLE ELEMENTS

John Musacchia, P.O. Box 452, Marathon, Fla. 33050

Continuation-in-part of Ser. No. 535,066, Sep. 23, 1983. This application Jan. 11, 1984, Ser. No. 569,879
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—422 17 Claims



1. In an arrow, the combination of

an arrow shaft having a tubular tip provided with a plurality of circumferentially spaced longitudinal slots which open through the free end of the tip;

an arrowhead body secured within the tubular tip of the arrow shaft and having a plurality of longitudinal slots and an axially extending space,

a leading end portion of the arrowhead body projecting forwardly from the tip of the arrow shaft and the slots and axial space of the body opening forwardly through said leading end portion,

the slots of the body each being aligned with a different one of the slots of the arrow shaft;

a blade assembly comprising at least two blades and being constructed and arranged to be inserted into the arrowhead body via the open ends of the axially extending space and the slots of both the body and the arrow shaft until the blades are each accommodated by a different one of the aligned pairs of slots of the body and the arrow shaft; and

a closure member releasably secured to the leading end portion of the arrowhead body to close the slots and axial space and retain the blade assembly in place.

4,558,869

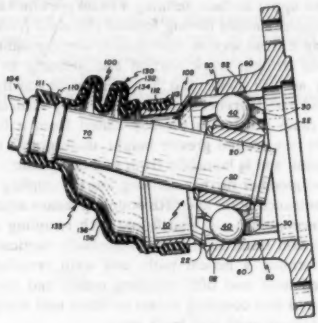
COVERING FOR ROTATING FLEXIBLE AXLE JOINTS

Clinton E. Grove, Elbow Lake, and Jeffery O. Golberg, Glenwood, both of Minn., assignors to Niwot Corporation, Longmont, Colo.

Continuation-in-part of Ser. No. 376,766, May 10, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 642,839

Int. Cl.[4] F16J *15/54*; F16D *3/84*

U.S. Cl. 277—1 **20 Claims**



1. A boot for sealingly enclosing a flexible, rotating joint comprising:

a boot body of flexible resilient material in the shape of a generally tubular bellows segment including a thin wall, first and second end openings and an external clamp groove encircling each end opening;

at least one longitudinal seam in said thin wall, running from one end opening to the other and including:

a first edge of said thin wall, and

a second edge of said thin wall having

thin-walled mating means thereon for mating with said first edge at a contact surface, such that the mating means and first and second edges of said thin wall are aligned to form a bellows segment having a substantially annular cross-section, said first edge and the mating means of said second edge being sealed and interbonded to one another by a thin, flexible, continuous, internal bond extending along the contact surface between them so that the seam has substantially the same flexing ability, thickness and weight as the rest of said thin wall; and

clamping means cooperating with each of said external clamp grooves to encircle each said end opening and compress the interior surface of each end opening radially inward toward the portion of the joint encircled by each said end opening.

4,558,870

MECHANICAL SEAL ASSEMBLY

Angel C. Martinez, La Habra, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 855,517, Nov. 28, 1977, abandoned. This application May 7, 1980, Ser. No. 147,680

Int. Cl.[4] F16J *15/34*

U.S. Cl. 277—15 **2 Claims**

1. A mechanical seal assembly for separating different fluids, one of which has undesirable properties and is supplied by a product pump driven by the shaft of a motor, which motor is immersed in another of said fluids comprising motor fluid, said seal assembly separating a first zone containing said fluid having said undesirable properties and a second zone containing said motor fluid, said seal assembly being located in a housing, and comprising:

a first seal ring connected to and rotatable with said shaft;

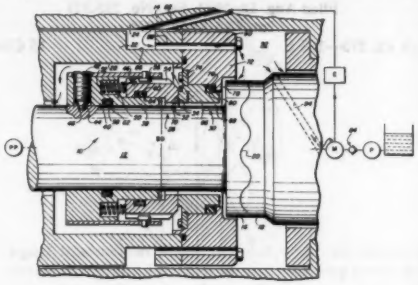
a second seal ring connected to said housing;

opposed radial seal faces on said seal rings;

resilient means urging said seal rings and the faces thereon toward one another;

a motor fluid supply means; and

means including a pump for pumping motor fluid from said supply means to said motor and from said motor to said



second zone, located radially inwardly of said seal faces, and at a pressure above the pressure of said one fluid with undesirable properties in said first zone, so as to flow radially outwardly across said seal faces to cool and lubricate said seal faces and prevent the flow of said one fluid with undesirable properties across said seal faces in a radially inwardly direction toward and into said second zone.

4,558,871

SEAL MEANS FOR COUPLINGS IN GAS CONDUITS

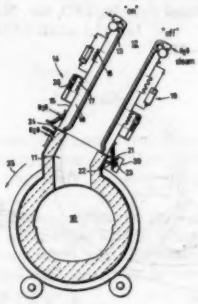
Rolf H. Pufal, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,662

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1982, 3237169; May 6, 1983, 3316562

Int. Cl.[4] F16J *15/34*

U.S. Cl. 277—84 **9 Claims**



1. A gas stack sealing arrangement for a coal gassification iron bath reactor comprising:

a rotatable vessel with a gas exhaust conduit having a first end extending perpendicular to an axis of rotation thereof and having an open second end extending at an oblique angle from said first end;

a gas stack with an open bottom end aligned with said open second end of said gas exhaust conduit in one rotational orientation said vessel and spaced from said gas exhaust conduit to permit rotation of said vessel;

a seal means comprising a flexible bellows attached at a first end to said gas stack and having an open second end

axially movable to engage with said gas exhaust conduit when said vessel is in said one rotational orientation;

said gas exhaust conduit having a circumferential flange adjacent to an open end of said conduit;

said seal means having a support frame circumferentially surrounding said open second end of said seal means;

a locking means secured at one end to said support frame and lockingly engagable with said exhaust conduit flange to lock said exhaust conduit and said gas stack together at said support frame and said flange;

said seal means further comprising lifting means to move said open second end axially to permit rotational clearance for said vessel.

4,558,872

SLIDE RING SEAL ASSEMBLY WITH NOVEL COMPRESSION SPRING

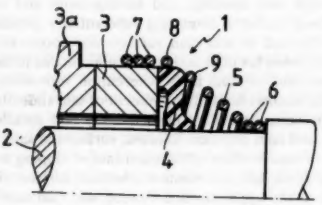
Paul Vossieck, and Karl vom Stein, both of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 719,305

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412594

Int. Cl.[4] F16J *15/36*

U.S. Cl. 277—88 **6 Claims**



1. In a slide ring seal assembly for installation on a shaft of a machine to provide a seal between the shaft and other components of the machine, including an axially displaceable slide ring arranged for surrounding the shaft in an installed state of the assembly; an elastic collar arranged coaxially with said slide ring and arranged for surrounding and circumferentially engaging the shaft in the installed state of the assembly, said elastic collar being in engagement with the slide ring for providing a static seal between the slide ring and the shaft in the installed state of the assembly and a helical compression spring having opposite first and second ends and formed of a plurality of spring wire turns; said compression spring being arranged coaxialiy with the slide ring and the elastic collar; said compression spring being arranged for surrounding the shaft in the installed state of the assembly and for exerting a radial force on the shaft with at least one first turn at said first end; said second end being situated at said slide ring and being operatively connected therewith for axially urging the slide ring towards a counterring in the installed state of the assembly; the improvement wherein at least one second turn at said second end of said spring circumferentially surrounds said slide ring with a radially inward bias; said elastic collar having an outer radial face oriented towards said first end, further wherein at least one third turn, situated between the first and the second ends, axially adjoins said outer radial face and is arranged for axially pressing against said radial face to exert an axial force on said slide ring via said elastic collar in the installed state of the assembly and further wherein at least one fourth turn is in engagement with an outer circumferential face of said elastic collar in a zone of said static seal for pressing said elastic collar radially against the shaft in the installed state of the assembly.

4,558,873

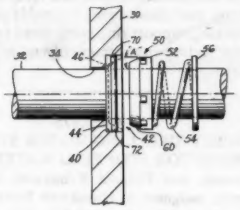
MECHANICAL SEAL

William J. Berthiaume, Exeter Rd., Exeter, N.H. 03833

Filed Aug. 1, 1983, Ser. No. 519,186

Int. Cl.[4] F16J *15/34*

U.S. Cl. 277—96.1 **5 Claims**



1. A mechanical seal for disposition about a rotatable shaft in a first annular recess in a housing, said seal comprising:

a head assembly disposed about said shaft and in the first annular recess in the housing, said head assembly having a second annular recess with a first tapered nonplanar surface in the shape of a truncated cone;

a rotor disposed about said shaft, said rotor being biased towards said head assembly by a spring, said spring secured to said shaft by holding means; said rotor having a second tapered nonplanar surface in the shape of a truncated cone; the first and second surfaces being planar in the direction of the taper;

the first nonplanar surface on said head assembly and the second nonplanar surface on said rotor, being in rotative contact with one another, to permit a self-seating between said non-planar surfaces of said head assembly and said rotor.

4,558,874

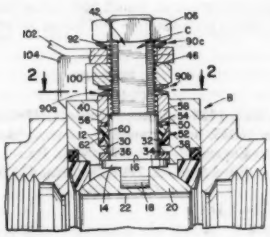
VALVE STEM PACKING ASSEMBLY

Peter C. Williams, Cleveland Heights; [illegible]ch H. Koch, Bainbridge Township, Ross County; Edward M. Yusko, Jr., Cleveland, and Thomas M. Mannion, University Heights, all of Ohio, assignors to Whitey Co., Highland Heights, Ohio

Filed Jul. 5, 1983, Ser. No. 510,884

Int. Cl.[4] F16J *15/18;* F16K *41/04*

U.S. Cl. 277—112 **10 Claims**



1. A valve stem packing comprising:

a valve body having a stem passage rotatably receiving a valve stem;

a first packing member and a second packing member axially coextensive surrounding said stem within said passage for sealing said passage against leakage of fluid therethrough, said packing members including first and second slippage surfaces being at least partially out of axial alignment for providing telescoping axial slipping engagement between said packing members;

for translation of axial force to radial force for expansion of said packing members relative to each other radially into sealing engagement with said passage and stem;

force applying means including spring means cooperating with said stem for imparting axial force to said packing members; and,

a packing support ring adjacent said packing members, and a gland interposed between said force applying means and said ring, said gland being rotatable with said stem, and said packing support ring being fixed relative to said valve body for sliding engagement of said gland to said packing support ring.

4,558,875

AQUEOUSLY-SWELLING WATER STOPPER AND A PROCESS FOR STOPPING WATER THEREBY

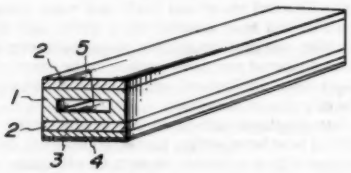
Hajime Yamaji, and Takeshi Kobayashi, both of Fukuyama City, Japan, assignors to Hayakawa Rubber Co. Ltd., Japan

Continuation of Ser. No. 249,628, Mar. 31, 1981. This application Dec. 12, 1984, Ser. No. 680,607

Claims priority, application Japan, Apr. 5, 1980, 55-44866; Nov. 14, 1980, 55-159406

Int. Cl.[4] E02D *29/16*

U.S. Cl. 277—227 **17 Claims**



1. An aqueously-swelling water-stopping composition consisting of: 10 to 40 weight % of rubber whose main ingredient is polyisobutylene having a molecular weight of from 70,000 to 130,000, 10 to 20 weight % of at least one silicate selected from the group consisting of silicic acid anhydride, hydrous silicic acid and calcium silicate, 10 to 60 weight % of bentonite, said silicate and bentonite acting as fillers, and 10 to 40 weight % of a plasticizer selected from the group consisting of paraffinic mineral oils, naphthenic mineral oils, aromatic mineral oils, stearic acid, palmitic acid, calcium stearate, castor oil, cotton seed oil, rapeseed oil, paraffin, paraffin chloride, dioctyl phthalate, dioctyl adipate, dibutyl sebacate, tricresyl phosphate, liquid chloroprene, liquid polyisobutylene, liquid polybutadiene, liquid polyisoprene and liquid polybutene.

4,558,876

CHUCK

Eugene H. Call, 1418 Richmond House, Golfview Manor, Meadville, Pa. 16335, and Armond D. Glover, Meadville, Pa., assignors to Eugene H. Call, Meadville, Pa.

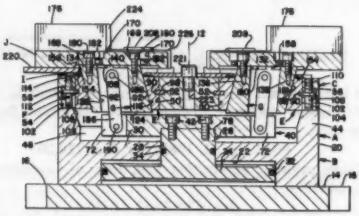
Filed Sep. 22, 1982, Ser. No. 421,084

Int. Cl.[4] B23B *31/10*

U.S. Cl. 279—1 DA **17 Claims**

1. A chuck for selectively gripping workpieces externally or internally generally radially of a longitudinal axis while simultaneously pulling the workpieces against stops, said chuck comprising:

support means for supporting components of a chuck and having a longitudinal axis, a plurality of circumferentially-spaced jaws supported by said support means for movement with components extending both radially and parallel to said axis, power means for selectively moving said jaws, motion conversion means connected between said power means and said jaws for converting movement of said power means generally parallel to said axis into movement of said jaws with components extending both radial and parallel to said axis, stops supported by said support means for abutment by workpieces gripped by said jaws, said motion conversion means being selectively reversible between first and second positions for respectively externally or internally gripping workpieces while simultaneously pulling same firmly against said stops in response to movement of said power means in a workpiece clamping direction, said support means including a top plate having a plurality of circumferentially-spaced openings therethrough receiving said motion conversion means, said openings including inner and outer substantially parallel cam surfaces spaced from one another generally radially of and inclined relative to said axis, said motion conversion means including slide blocks extending



through said openings and having inner and outer cam follower surfaces extending substantially parallel to one another and to said cam surfaces for cooperation therewith, means for connecting said slide blocks to said power means and to said jaws whereupon movement of said power means results in movement of said slide blocks with components extending both radially and parallel to said axis, said cam and cam follower surfaces in said first position of said motion conversion means sloping outwardly away from said axis from the bottom surface of said top plate to the upper surface thereof, and said cam and cam follower surfaces in said second position of said motion conversion means sloping inwardly toward said axis from the bottom surface of said top plate to the upper surface thereof.

4,558,877

STEERING SYSTEM FOR VEHICLES

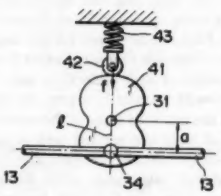
Yoshimi Furukawa, Saitama; Shoichi Sano, Tokyo, and Hiroshi Takamatsu, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,151

Claims priority, application Japan, Dec. 8, 1982, 57-214821

Int. Cl.[4] B62D *7/00*

U.S. Cl. 280—91 **6 Claims**



1. A mechanical steering system for a vehicle including a front wheel and a rear wheel, comprising:

a steering wheel;

a front wheel steering sub-system for steering said front wheel in accordance with the steering angle of said steering wheel;

a rear wheel steering sub-system for steering said rear wheel in accordance with the steering angle of said steering wheel; and

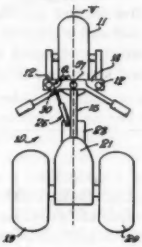
said rear wheel steering sub-system having mechanical means for producing a torque so as to compensate for the variation of the steering torque necessary for turning said rear wheel.

4,558,878

ALL TERRAIN CYCLE WITH STEERING STABILIZER

Donald L. Motrenec, 410 11th St., Huntington Beach, Calif. 92648

Filed Sep. 23, 1983, Ser. No. 535,349
Int. Cl.⁴ B62K *21/08*
U.S. Cl. 280—272 **6 Claims**



1. An improved all terrain cycle of the type having a single front steerable wheel mounted on a pivotable frame, which pivotable frame is held by a main frame of the vehicle which pivotable frame is turned by the movement of a pair of handlebars wherein the improvement comprises:

a damper assembly having a piston held within a fluid filled cylinder, said damper assembly being pivotably connected at a first end to the pivotable frame at a distance between three and one-half and six inches from the axis of rotation of the pivotable frame and at a second end to the main frame of the vehicle at a point substantially rearward with respect to the first end and near the line of intersection of an imaginary vertical plane that includes a central longitudinal axis of the cycle and an imaginary plane which is perpendicular to the axis of rotation of the pivotable frame and which passes through the point of connection of the first end of the damper assembly.

4,558,879

TRAILER FOR A TRUCK

Richard Palfinger, Salzburg, Austria, assignor to Palfinger, Austria

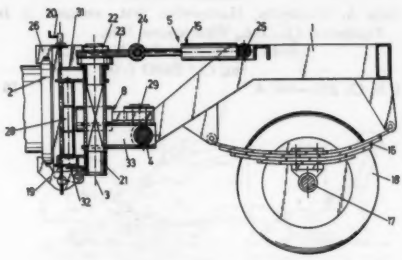
PCT No. PCT/AT82/00033, § 371 Date Aug. 12, 1983, § 102(e) Date Aug. 12, 1983, PCT Pub. No. WO83/02258, PCT Pub. Date Jul. 7, 1983
PCT Filed Nov. 18, 1982, Ser. No. 531,826
Claims priority, application Austria, Dec. 24, 1981, 5562/81
Int. Cl.⁴ B60P *1/54*
U.S. Cl. 280—406 R **3 Claims**

1. A trailer for a truck having a supporting frame for a loading crane or the like, the trailer selectively being flexibly or rigidly connected to the truck or removed from said truck, characterized in that fastening means are rigidly and detachably connectable to a vertical plate fixed at the rear end of the truck, said fastening means comprising:

a vertical shaft for pivoting motion of the trailer around a vertical axis;

a transversely extending horizontal shaft for pivoting motion of the trailer around a horizontal axis, said horizontal shaft being pivotable about a first end of said vertical shaft;

at least one hydraulic unit having a piston and a cylinder, said hydraulic unit being disposed between the frame of the trailer and the second end of said vertical shaft, such



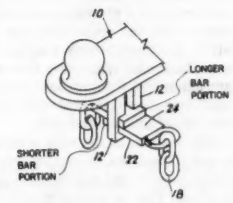
that the relative positions of the piston and cylinder are fixable.

4,558,880

COUPLING MEMBER

Terry Nangle; John Nangle, both of Caversham, Australia, and Salih Kazim, 19 Hibberta Ct., Forrestfield Heights, Western Australia, Australia 6058, assignors to Salih Kazim, Forrestfield Heights, Australia

Filed May 20, 1983, Ser. No. 496,550
Int. Cl.⁴ B60D *7/02*
U.S. Cl. 280—457 **3 Claims**



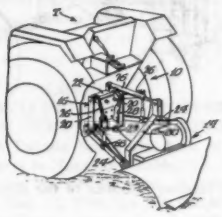
1. A coupling device comprising a flat slotted member containing an elongated slot of predetermined width and length and a pair of flat key members, each said key member comprising a wide body portion, an intermediate narrow neck portion of a width for registering in the slot without rotation and a wide flat bar portion substantially at right angles to the neck portion and at an end remote from the wide body portion, said wide body portion of each key member being attached to a respective flexible element, and the elongated slot of said flat slotted member being orientated vertically and containing an enlarged portion of greater width than the remainder of the slot positioned at the lowermost end of the slot to receive rotatably therein the neck portion of only one key member at a time with the remainder of the slot being too narrow to allow rotation of the neck portion, and two key members engaged in the slot to lie one above the other in the slot with the upper key inhibiting rotation of the lower key, whereby each key is engaged sequentially with said slot by aligning the bar portions with said slot, and passing each flat bar portion through the slot, moving the neck portion downwardly until it is in the enlarged portion of the slot and rotating the key so that its bar portion engages the slotted member to prevent withdrawal of the key from the slot.

4,558,881

TRACTOR-MOUNTED IMPLEMENT HITCH ARRANGEMENT

Dale A. Manteufel, Hortonville, Wis., assignor to Ingersoll Equipment Co., Inc., Winneconne, Wis.

Filed Oct. 11, 1983, Ser. No. 540,276
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—460 A **18 Claims**



1. An improved three-point hitch arrangement adapted to be mounted to a tractor, or the like, comprising:

mounting means for effecting a fixed connection with said tractor;

a pair of upper arms pivotally connected with said mounting means for vertical movement with respect thereto;

a pair of lower arms pivotally connected with said mounting means for vertical movement with respect thereto spaced below said upper arm means;

a pair of link means extending between and interconnecting respective ones of said upper arms and said lower arms;

a pair of connector means operatively respectively connecting said upper arms and each said link means for pivotal movement of said link means with respect to said upper arms about respective first and second perpendicular axes, each said connector means comprising connector block means, first means for pivotally connecting said connector block means with the respective one of said upper arms for relative movement with respect to said respective upper arm about said respective first axis, and connector pin means extending through said connector block means along said respective second axis for relative pivotal movement about said second axis,

said connector pin means defining a bore receiving the respective one of said link means for movement within said bore, whereby each said connector means and the respective one of said link means cooperate to permit sufficient limited upward vertical movement of said link means relative to said connector means whereby said lower arms are movable vertically without corresponding vertical movement of said upper arms to provide floating of an associated implement mounted on said hitch arrangement; and

motor means operatively connected to at least one of said upper arms for raising and lowering said upper and lower arms in unison.

7. An improved three-point hitch arrangement adapted to be mounted to a tractor or the like, comprising:

mounting means for effecting a fixed connection with said tractor;

a pair of lower arms pivotally connected with said mounting means;

a pair of upper arms pivotally connected with said mounting means and spaced above said lower arms, each of said upper arms including a free end having a receiving portion of bifurcated construction and having a pair of flanges;

a pair of links respectively connecting said upper and lower arms and including a pair of shafts each threaded at one end and each including a head portion at the other end, each of said shafts extending generally between the receiving portion of a respective one of said pair of upper arms and a respective one of said pair of lower arms;

a pair of connector means respectively connecting each of said pair of shafts with a respective one of said bifurcated receiving portions,

each said connector means including a rectangular connector block pivotally connected to the respective receiving portion with a pair of pivot pins for relative movement about a respective first axis, a connector pin extending through said rectangular connector block along a respective second axis perpendicular to the respective first axis for pivotal movement about the second axis with respect to the connector block with a respective one of said shafts extending through said connector pin for limited relative vertical movement, and protective spacer means mounted and freely movable on each of said shafts between the respective connector pin and said shaft head portion, said spacer means being adapted to contact said rectangular connector block attendant to movement of said shaft about the respective second axis to prevent contact between said shaft and said connector block; and

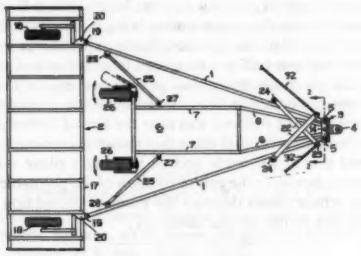
motor means operatively connected to said pair of upper arms for raising and lowering said upper and lower arms in unison.

4,558,882

SEEDER CART ATTACHMENT TO AGRICULTURAL IMPLEMENTS

Albert K. Fuss, 1 Jellicoe St.; Eric W. Fuss, 3 Heller St.; Jarvis R. Fuss, 143 Tourist Rd., and Roy M. Fuss, 21 Leslie St., all of Toowoomba, Queensland 4350, Australia

Filed Oct. 6, 1983, Ser. No. 539,667
Claims priority, application Australia, Oct. 8, 1982, PF6258
Int. Cl.[4] B60D *7/02*; A01B *73/00*
U.S. Cl. 280—476 A **8 Claims**



2. A seeder cart attachment to an agricultural implement in which a seeder cart has rear castor wheels and a forward draft member adapted to be engaged on traction means and supports at least a bin for seed and/or fertiliser and means to discharge the seed and/or fertiliser to the said agricultural implement, characterised by

(a) a pull head adapted to be connected to the said draft member,

(b) a central connecting pin on the said pull head,

(c) a pair of coupling pins on the said pull head spaced from the said central pin with one pin on each side to engage the forward ends of draft bars projecting forwardly from the said agricultural implement and at least one being withdrawable to release the draft bar engaged by it,

(d) universal pivot means on the said pull head engaging the said central connecting pin to couple the said pull head to the said draft bars, and

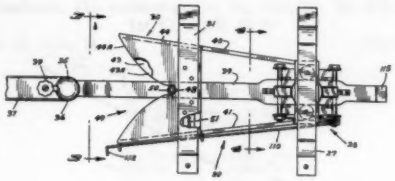
(e) limited telescopic stabilizer bars connected between the draft bars and the rearward portion of the seeder cart to limit movement of the said seeder cart between the said draft bars.

4,558,883

HITCH ASSEMBLY

James R. Bouma, Foreston, Minn., assignor to Herbert F. Dalglish, St. Paul and George D. Weitgenant, Dayton, both of, Minn., part interest to each

Filed Feb. 3, 1984, Ser. No. 576,873
Int. Cl.[4] B60D *7/02*
U.S. Cl. 280—478 A **54 Claims**



1. A hitch assembly mounted on a first vehicle for connection to a hitch member of a second vehicle for towing of one vehicle by the other, comprising:

a guide unit mounted on said first vehicle including a guide plate having a trailing edge with a contour defining a central pocket and guide edge sections extending from the pocket in rearwardly diverging relationship forming a rearwardly open fan-shaped mouth;

a latch assembly mounted in longitudinal alignment with and spaced forward of the guide unit, said latch assembly having releasable drawbar latch means;

an elongate drawbar assembled with respect to the guide unit and latch assembly, said drawbar rearwardly extendible to a movable position and forwardly retractable to a latched position, said drawbar having a forward end and a rearward end, said drawbar having connecting means on a forward portion for connection with the latch means of the latch assembly with the forward end extended beyond the latch assembly, and coupling means at the rearward end for coupling with a hitch member of a second vehicle;

said latch means being engageable with the connecting means of the drawbar to secure the drawbar, and releasable from the connecting means permitting the drawbar to be extendible rearwardly and movable from side to side for proper location to be coupled with a hitch member on a second vehicle;

said drawbar carrying a drawbar guide roller assembly having at least one guide roller located to be situated in the pocket of the guide plate when the connecting means is secured with respect to the latch assembly, and positioned on the drawbar for cooperation with the guide edge sections of the guide plate upon retraction of the drawbar from the extended position toward the latched position of the guide roller located in the guide plate pocket.

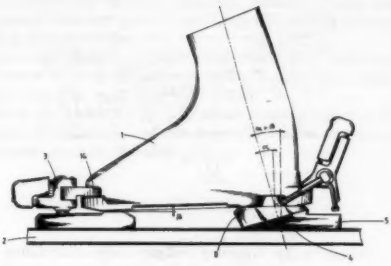
4,558,884

REAR ELEMENT FOR A SKI BINDING

Jean-Claude Guitel, Nevers, and Daniel le Faou, Varennes Vauzelles, both of France, assignors to Ste Look, Nevers, France

Filed Apr. 13, 1984, Ser. No. 600,012
Claims priority, application France, May 17, 1983, 83 08116
Int. Cl.[4] A63L *9/082*
U.S. Cl. 280—620 **3 Claims**

1. A rear ski-binding element for fixing a ski boot on a ski, comprising a heel-holding member carried by a plate which serves as a bearing surface for said member, and means mounting said plate for rotation about its center, the axis of rotation of said plate being forwardly inclined at an angle approximately within the range of 8° to 20° with respect to a vertical axis perpendicular to the top surface of the ski so that this inclination comes close in value to the angle of slope assumed by the skier's leg as a result of the shape of a ski boot, the top



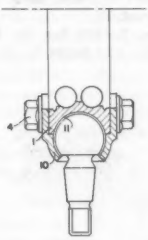
surface of said rotary plate being substantially parallel to the top surface of the ski.

4,558,885

HUB BEARING UNIT HAVING A BALL JOINT

Sture Asberg, Göteborg, Sweden, assignor to SKF Nova AB, Göteborg, Sweden

Filed Oct. 27, 1983, Ser. No. 545,923
Claims priority, application Sweden, Nov. 26, 1982, 82026751
Int. Cl.[4] B60B *35/00*
U.S. Cl. 280—674 **4 Claims**



1. A hub bearing assembly for a vehicle comprising inner and outer spaced ring members defining an annular space therebetween for a plurality of rolling elements, said inner ring having means for mounting a wheel of a vehicle, and said outer ring having means for mounting the hub bearing unit to the vehicle including means mounting said ball joint directly to said outer ring to form an integral unit for quick and easy assembly and disassembly of the hub bearing and ball joint as a unit.

4,558,886

FLUID CIRCUIT MEANS FOR ELEVATING THE REAR END OF AN AIR RIDE TRUCK TRAILER

Gerald J. Straub, 6969 Madden Rd., Dexter, Mich. 48130

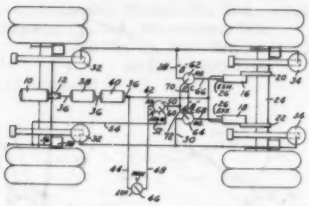
Filed Sep. 22, 1983, Ser. No. 534,736
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—711 **6 Claims**

1. In combination with vehicle suspension means on at least one axle for supporting the vehicle bed and automatic means in engagement with the vehicle suspension means to control the height and roll of the vehicle bed,

the improvement characterized by,

means to manually expand and contract the suspension means thereby raising and lowering the bed of the vehicle, said manual means comprising means to bypass the automatic control of the height of the suspension means, manually controllable means in communication with the bypass

means to actuate the bypass means and means in communication with said manually controllable means and the



vehicle brakes whereby said manually controllable means are operable to actuate the bypass means only when the vehicle brakes are engaged.

4,558,887

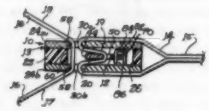
SNUBBING SLIP RING

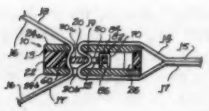
Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Hazel Crest, Ill.

Filed Sep. 2, 1983, Ser. No. 529,093

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—802 **5 Claims**





1. A passive restraint seatbelt assembly having an adjustable length belt linked at one end to a vehicle and having a folded loop at its free end, a fixed length slideable belt linked at each end to a vehicle, and a snubbing slip ring through which said folded loop is threaded and through which said slideable belt is threaded for sliding therethrough; said snubbing slip ring comprising:

a housing having upper and lower slot means;

a snubbing bar disposed in said housing for movement between a release portion whereat said slideable belt slides freely through said upper and lower slot means, and a snubbing position whereat said snubbing bar abuts and frictionally restrains said slideable belt, said folded loop folding along said upper and lower slot means and along a portion of said snubbing bar which is disposed behind said upper and lower slot means in said release position so that tension on said adjustable length belt straightens that folded loop between said upper and lower slot means and pushes said snubbing bar forward into said snubbing position.

4,558,888

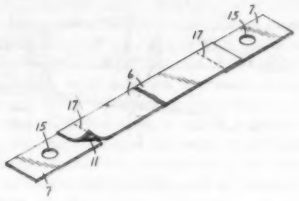
STRIP OF BINDING TAPE

Gary R. Hanson, Minneapolis, and George R. Rabuse, Sunfish Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 533,508, Sep. 19, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,630

Int. Cl.[4] B42D *1/00, 5/04;* B42C *9/00;* B42B *9/06*

U.S. Cl. 281—23 **15 Claims**



1. A strip of binding tape comprising

a strip of porous non-woven fibrous backing of polymeric material,

a coating of an acrylic pressure-sensitive adhesive on one surface of the backing, and

means defining a tab on at least one end of a said strip covering at least a portion of said adhesive, said tab being separable from said strip and having an opening therein for alignment of a said strip.

4,558,889

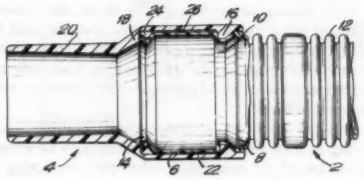
AQUATIC VACUUM HOSE SWIVEL CUFF

Leo Gans, Teaneck, N.J., assignor to Action Technology, Rockaway, N.J.

Filed Oct. 26, 1984, Ser. No. 665,391

Int. Cl.[4] A47L *9/24*

U.S. Cl. 285—7 **6 Claims**



1. A hose and swivel cuff, comprising, in combination:

a flexible blow-molded hose portion which has at least one end which terminates as a substantially right cylindrical end portion and which has a hose ring provided substantially adjacent to said cylindrical end portion whereby a circumferential groove is provided between said cylindrical end portion and said hose ring; and

a molded cuff which has a seating portion for receiving said cylindrical end portion of said hose and a rigid first annular ring adapted to fit within said circumferential groove of said hose, said first annular ring being provided about the hose entrance to said seating portion of said cuff;

wherein the inner diameter of said first annular ring is less than the outer diameter of said cylindrical end portion, the cylindrical end portion of said hose is maintained within said seating portion by said first annular ring being snap-fitted within said circumferential groove such that said hose end is locked in the longitudinal direction within said cuff, and said hose portion is swivelably rotatable within

said cuff and water may seep around the outer circumference of said cylindrical end portion and into said cuff.

4,558,890

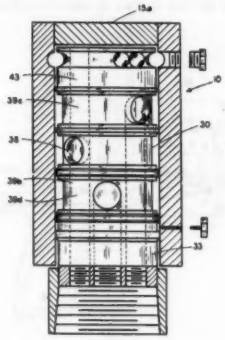
MULTI-PORT HYDRAULIC SWIVEL

Charles O. Schartz, Larned, Kans., assignor to Pickle Creek Mfg., Inc., Larned, Kans.

Continuation-in-part of Ser. No. 470,299, Feb. 28, 1983, abandoned. This application Jun. 10, 1983, Ser. No. 501,553

Int. Cl.⁴ F16C *39/04*

U.S. Cl. 285—13 **10 Claims**



1. A multi-port hydraulic swivel joint of the type having coaxial stator and rotor elements forming a unit having an axially spaced flow channel for each port for receiving high pressure fluid from a stationary pump into a first end of the stator element and delivering it to a hydrostatic motor which revolves about the swivel joint, for receiving return fluid under low pressure from the motor and delivering it from the stator first end to a stationary reservoir located adjacent to the pump, and for receiving low pressure fluid from the reservoir into the stator first end and delivering it to a valve means which also revolves about the swivel joint, the improvement comprising a rotor element which is characterized as being a hollow cylinder having a cap affixed to its end which is adjacent to the stator second end; the low pressure fluid flow channel being located nearest to the stator first end, the high pressure flow channel farthest from the stator first end and the return flow channel between the other two; and a stator which is characterized as being substantially of solid material and having L-shaped passageways therewithin for delivering high pressure and low pressure fluid and a T-shaped passageway therewithin wherein the stem of the T-shape is connected to the return flow channel, one arm of the T-shape communicates with the reservoir and the other arm of the T-shape communicates with the cavity formed by the cap and the stator second end, whereby any high pressure fluid escaping from the high pressure flow channel into said cavity or into said return flow channel can escape therefrom for delivery to the reservoir without entering the low pressure flow channel.

4,558,891

CLAMP FOR EXHAUST SYSTEM

Wayne M. Wagner, Apple Valley; Steven D. Schmeichel, Inver Grove Heights, and Timothy A. Bethke, Apple Valley, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jul. 14, 1983, Ser. No. 513,920

Int. Cl.⁴ F16B *2/08*

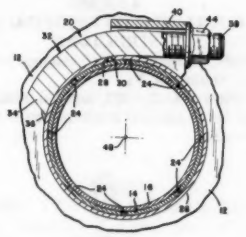
U.S. Cl. 285—322 **12 Claims**

1. In combination with an exhaust treatment device having an outer tube adapted for receiving the end of an inner tube, a heavy-duty clamp for securing the overlapped ends of the tubes to form a lap joint, comprising:

a split generally cylindrical band having inside and outside circumferential surfaces, opposite circular edges, and opposite adjacent spaced apart longitudinal ends defining a gap therebetween;

an extension secured to the outside surface of said band adjacent one end thereof, said extension including a generally tangential opening therethrough;

a bolt positioned over the gap about midway between the edges of said band, said bolt having a curved end and an opposite straight threaded end;



the curved end of said bolt being circumferentially engaged with the outside surface of said band on opposite sides of the gap but secured to said band only adjacent the other band end, with the straight threaded end slideably extending through the opening in said extension; and

a nut secured to the threaded end of said bolt, the curved end of said bolt and said extension being respectively secured to said band adjacent its respective ends over predetermined circumferential arc distances so that the effective closing force line exerted upon said split band by tightening said nut against said extension passes across said band substantially tangential to said gap.

4,558,892

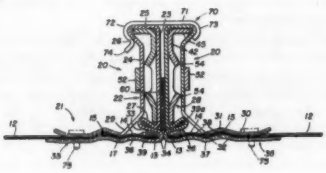
DUCT ASSEMBLY SYSTEM

David E. Daw, Los Angeles, and Arthur F. Vlastnik, Cardiff-by-the-Sea, both of Calif., assignors to Quikduc of California, Inc., Los Angeles, Calif.

Filed Nov. 16, 1983, Ser. No. 552,098

Int. Cl.⁴ F16L *23/00*

U.S. Cl. 285—331 **28 Claims**



1. A duct assembly system for joining adjacent duct sections, each having a plurality of duct walls terminating at distal edges and meeting at duct corners, said system comprising: a plurality of elongated generally L-shaped angle member connectors respectively associated with the duct walls of both duct sections, each of said connectors including two generally perpendicular leg portions, one of said leg portions including two flexible flanges resiliently biased together and cooperating to define therebetween a channel adapted for receiving therein the distal edge of the associated duct wall; one of said flexible flanges on each of said connectors having an elongated ridge projecting into said channel toward the other one of said flexible flanges and extending generally parallel to the distal edge thereof, each of the duct walls having an elongated continuous

rib projecting from the plate thereof without perforation thereof and having a longitudinal axis spaced from and extending substantially parallel to the distal edge thereof, said flexible flanges accommodating cammed movement of said duct wall rib past said ridge when said duct wall is received between said flexible flanges, said rib being engageable with said ridge for interlocking the duct wall and said associated connector; and means interconnecting said connectors on each duct section and connecting the connectors on one duct section respectively with the corresponding connectors on the other duct section securely to hold said duct sections together.

4,558,893

NON-ROTATABLE TELESCOPING SUPPORT STRUCTURE

James E. Shelly, Walnutport, Pa., assignor to Keystone Lamp Mfg. Corp., Slatington, Pa.

Filed Jul. 22, 1983, Ser. No. 516,027
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—354 **6 Claims**

1. A non-rotatable telescoping support structure comprising:
an outer tubular component having a bore of cross section the shape of a convex polygon, one end of said outer component having an external thread;
an inner tubular component having an outer surface with a cross section of shape corresponding to the cross section of the outer component bore, said inner component being slidable within the bore of said outer component, but relative rotation being prevented by engagement of a corner of said inner component with the inner surface of said outer component adjacent to a corner of the outer component bore; and
a split ring assembly including a cap theadable on said outer component external thread and a split ring engagable with the inner component corner to deter relative longitudinal movement between said inner component and said outer component when said cap is tightened on the outer component external thread.

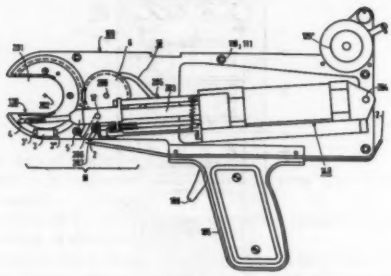
4,558,894

METHOD AND DEVICE FOR TYING A BUNDLE OF ELECTRICAL WIRES

Max Detterbeck, Nuremberg, and Emil Dümmler, Schwaig, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,180
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337853
Int. Cl.[4] H05K *13/06;* **B65H** *69/04*
U.S. Cl. 289—1.5 **13 Claims**

1. In a method for tying a bundle of electrical wires comprising the steps of (a) pulling a thread from a reel or the like, (b) holding a leading portion of the thread proximate to the bundle of wires in a plane oriented substantially transversely to a longitudinal axis of said bundle, (c) automatically pulling said thread at an intermediate point thereof in a first direction about said axis to form one loop, step (c) being executed on a first side of said bundle, (d) continuing to automatically move said one loop in said first direction while automatically pulling a remaining portion of said thread about said bundle in a second direction opposite said first direction, (e) automatically pulling said remaining portion of said thread at intermediate point thereof in said second direction through said one loop on a second side of said bundle substantially opposite said first side to form another loop, (f) continuing to move said other loop in said second direction about said bundle while pulling the remaining portion of said thread in said first direction about said



bundle, and (g) repeating steps (c) through (f) along the length of said bundle, the improvement comprising the steps of:
(h) automatically terminating the continued repetition of steps (c) through (f) upon the completion of a preselected number of repetitions;
(i) automatically laying, in a chain-like formation, a plurality of additional loops of the thread on one side of the bundle of wires, thereby forming a knot in said thread;
(j) automatically cutting said thread at said knot, thereby forming a new leading end of the thread extending from the reel; and
(k) automatically gripping and holding said new leading end, whereby said new leading end of the thread is available for a subsequent tying operation.

4,558,895

PULLING TOOL

Jack W. Tamplen, Celina, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

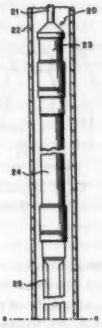
Filed Feb. 11, 1981, Ser. No. 233,473
Int. Cl.[4] E21B *31/00, 31/02*
U.S. Cl. 294—86.18 **15 Claims**

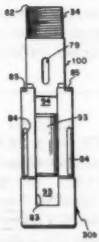
1. A pulling tool comprising:
a. an elongate core means having a first, second, and third section;
b. a housing means releasably secured to the first section and surrounding the exterior of the second and third sections of the core means;
c. one end of the first section projecting longitudinally from the housing means for engagement with a wireline tool string;
d. the second section having a longitudinal bore extending partially therethrough from one end and threads on the other end;
e. the other end of the first section slidably disposed within the bore of the second section;
f. one end of the third section having threads thereon and engageable with the threads on the other end of the second section;
g. the housing means extending longitudinally from the other end of the third section and having an opening therein to receive a well tool;

h. flexible latching fingers, carried by the third section and the housing means, extending longitudinally from the other end of the third section;

i. a shoulder on each finger, spaced longitudinally from the other end of the third section, projecting radially inward with respect to the opening;

j. the fingers having a first position in which the fingers are





flexed inward allowing the shoulders to secure a well tool within the opening and a second position in which the fingers are flexed outward to release the shoulders from the well tool; and

k. means for varying the longitudinal spacing between the other end of the third section and the shoulders by adjusting the threaded engagement between the second and third sections of the core means.

4,558,896

HANDLE

David J. Farnworth, 11 Kemsley Rd., Felixstowe, Suffolk, England

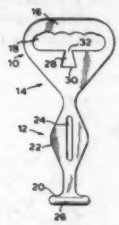
Filed Dec. 13, 1983, Ser. No. 560,804

Claims priority, application United Kingdom, Dec. 15, 1982, 8235655; Aug. 9, 1983, 8321378

Int. Cl.⁴ A45C *13/26*; B65D *71/00*

U.S. Cl. 294—156 **5 Claims**

1. A handle having a grip portion and a single elongate strap portion which has a longitudinal axis and is connected to the grip portion so that said axis extends through the center of the grip portion, with the grip and strap portions being formed in a single piece of bendable and twistable material, and the handle having a median plane containing the longitudinal axis and lying intermediate the faces of the strap portion, the handle being symmetrical on either side of said median plane, the strap portion having a free end with a terminal enlargement in the form of a T-bar at right angles to said axis, and another part of the handle, between the grip portion and the terminal enlargement having a slot which has angled sides with the wider part of the slot at the bottom and the narrower part at the top whilst the width of the strap portion adjacent the T-bar is greater than the width of the narrower part of the slot, but less than the width of the wider part of the slot, so that when the strap portion is turned back on itself, the free end can be detachably



connected to said another part of the handle to form a loop, the free end being placed through the slot so that the T-bar engages behind the slot.

4,558,897

MOVABLE TYPE AIR BALANCE PANEL

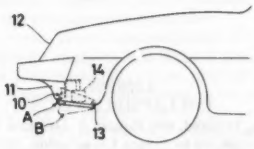
Teiji Okuyama; Kazutaka Kuwana, both of Toyota, and Masanobu Ishikawa, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 3, 1982, Ser. No. 404,658

Claims priority, application Japan, Aug. 5, 1981, 56-121869; Aug. 5, 1981, 56-121870

Int. Cl.⁴ B62D *37/02*

U.S. Cl. 296—1 S **17 Claims**



17. A movable type air balance panel movably mounted on a vehicle body for improving aerodynamic characteristics of said vehicle wherein said air balance panel comprises:

an actuator means operatively coupled to said air balance panel to move said air balance panel in an upward and downward direction such that said air balance panel, normally housed in said vehicle body, is projected from said vehicle body so as to improve the aerodynamic characteristics of said vehicle; and

an electric control circuit means coupled to said actuator for electrically controlling said actuator so as to project said air balance panel from said vehicle body when a speed of said vehicle reaches a first predetermined speed and to house said air balance panel in said vehicle body when the speed of said vehicle reaches a second predetermined speed below that of said first predetermined speed.

4,558,898

AERODYNAMIC WING DEVICE AND METHOD OF MAKING SAME

Dann T. Deaver, 20565 Williamsburg Ct., Harper Woods, Mich. 48236

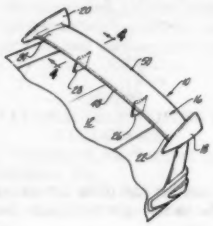
Filed May 22, 1984, Ser. No. 613,054

Int. Cl.⁴ B62D *35/00*

U.S. Cl. 296—1 S **26 Claims**

1. An aerodynamic wing device adapted to be mounted horizontally on an automotive type vehicle, said aerodynamic wing device including a substantially hollow elongated body

having generally horizontal upper and lower peripheral wall portions interconnected to enclose said body, said body being formed by bending into a predetermined horizontally swept configuration, said peripheral wall portions having a wall thickness that decreases from a generally compressed inner side portion of said body to a generally tensioned outer portion of said body, said wall thickness tapering from approximately



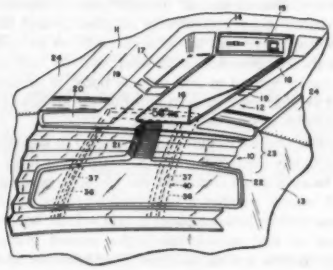
0.1 inch to approximately 0.06 inch, said wall thickness being greater at said generally compressed inner side portion of said horizontally swept body in order to substantially prevent buckling of said horizontal peripheral wall portions at said compressed inner side portion during bending to form said horizontally swept configuration, said swept configuration being in the range of a zero sweep to approximately a No. 15 sweep without buckling.

4,558,899

COLLAPSIBLE VISOR

Zooey C. Chu, Holland, and Ronald A. Dykstra, Rockford, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Mar. 26, 1984, Ser. No. 593,512
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97 G **14 Claims**



1. A visor for a vehicle comprising:

a visor frame including a pair of generally parallel spaced guide arms;

a flexible visor panel supported by said guide arms in movable relationship thereto; and

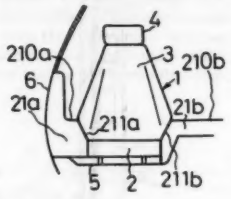
housing means for movably mounting said frame to a vehicle for supporting said frame between a retracted position with said flexible panel in a collapsed position and an extended position in which said panel is opened for use of the visor, said housing including means for guidably receiving and supporting said guide arms of said frame.

4,558,900

VEHICULAR SEAT

Masanori Nagata, Kasugai, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 28, 1984, Ser. No. 584,384
Claims priority, application Japan, Feb. 28, 1983, 58-29524
Int. Cl.[4] B60J *5/00*
U.S. Cl. 296—152 **4 Claims**



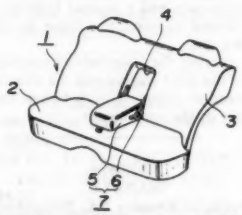
1. A vehicular seat provided with a seat cushion and having side support members for the occupant respectively on door side and vehicle-room center side of the seat, the side support member on the door side being formed integrally with a door at a lower inside portion thereof and having a shelf-like upper surface projecting inward of the vehicle room above the seat cushion and a side surface depending from the inner edge of said upper surface downward to the corresponding side of the cushion, and the side support member on the vehicle-room center side having an upper surface positioned at substantially the same height as said upper surface of the side support member on the door side.

4,558,901

ARM REST DEVICE OF A SEAT FOR A VEHICLE

Sho Yokoyama, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Aug. 23, 1983, Ser. No. 525,819
Int. Cl.[4] A47C *13/00*; B60N *1/06*
U.S. Cl. 297—113 **4 Claims**



1. An arm rest for a vehicle seat comprising an arm rest body; and linkage means adapted for pivotally mounting said arm rest body to the vehicle seat so that said arm rest body is pivotally movable between an inoperative position and an operative position, said linkage means including inclination adjustment means for permitting the selective inclination of said arm rest body between a plurality of arm rest positions when said arm rest body is in said operative position, said inclination adjustment means including,

a base plate coupled to said linkage means and having shaft means to pivotally mount said base plate to said arm rest body so that said arm rest body is pivotally movable about said shaft means relative to said base plate;

said base plate also including means defining a slot for receiving said shaft means to also mount said base plate to said arm rest body so that said arm rest body is reciprocally displaceable relative to said base plate between forward and rearward positions;

tooth plate means rigidly associated with said base plate for

defining a plurality of teeth each of which establishes a respective one of said arm rest positions;

connecting pin means rigidly associated with said arm rest body for engaging a predetermined one of said defined teeth to thereby releasably retain said arm rest body in said arm rest position established by said predetermined one of said defined teeth; and

biasing means for exerting a biasing force to said arm rest body which tends to move said arm rest body into said forward position thereby causing said connecting pin means to engage said predetermined one of said defined teeth; wherein

said arm rest body is forcibly displaceable relative said base plate into said rearward position to cause disengagement between said connecting pin means and said predetermined one of said defined teeth to responsively permit said arm rest to be pivotally moved relative said base plate about said shaft means to another of said arm rest positions, said biasing means, upon release of said forcible displacement into said rearward position, thereby forwardly displacing said arm rest body to responsively effect interengagement between said connecting pin means and another one of said defined teeth which corresponds to said another arm rest position, whereby the inclination of said arm rest body is adjusted.

4,558,902

TRAVEL SEAT

Hermann Meiller, Amberg, Fed. Rep. of Germany, assignor to Messrs. Willibald Grammer, Fed. Rep. of Germany

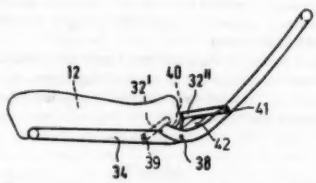
PCT No. PCT/EP83/00009, § 371 Date Aug. 12, 1983, § 102(e) Date Aug. 12, 1983, PCT Pub. No. WO83/02550, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 18, 1983, Ser. No. 531,830

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201650

Int. Cl.⁴ A47C *1/024, 7/14, 7/46*

U.S. Cl. 297—284 **2 Claims**



1. A travel seat comprising a seat cushion, a seat cushion carrier, a backrest cushion and a backseat cushion carrier pivotally mounted relative to the seat cushion carrier and further including a flap pivotally mounted to said seat cushion carrier in a region thereof proximate said backrest cushion carrier means for movement about an axis extending transversely with said seat cushion carrier, said backrest cushion carrier including a member to positively engage said flap of said seat cushion carrier upon rearward pivotal movement of said backrest cushion carrier means to cause said flap to pivot out of said seat cushion carrier.

4,558,903

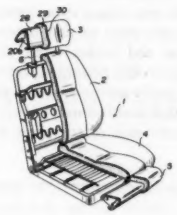
ANGLE ADJUSTMENT DEVICE OF A MOVABLE BODY FOR A VEHICLE SEAT

Genziro Takagi, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,910

Int. Cl.⁴ A47C *7/36*

U.S. Cl. 297—408 **5 Claims**



1. An angle adjustment device for a movable body of a vehicle seat comprising:

a bracket adapted to being rigidly fixed to the vehicle seat;

a frame for the movable body;

sector plate means for pivotally mounting said frame to said bracket, said frame and sector plate means thus being pivotally movable relative to said bracket about a pivot axis between first and second extreme positions, said sector plate means including first and second radially spaced-apart limit arms which respectively establish said first and second extreme positions, and means defining plural teeth for establishing respective pivot positions intermediate said first and second extreme positions,

engagement means operatively associated with said bracket for sequentially engaging said defined plural teeth when said sector plate is pivotally moved in a first pivotal direction, said engagement means including (a) means defining an elongate slot in said bracket radially extending from said pivot axis, (b) rod means for engaging said defined teeth and being slidably displaceable within said slot between an advanced position wherein said rod means is engaged with a predetermined one of said defined teeth to prevent pivotal movement of said sector plate means relative to said bracket in a second pivotal direction, opposite to said first pivotal direction, and a displaced position wherein said rod means is disengaged from said defined teeth and (c) biasing means for biasing said rod means into said advanced position,

said sector plate means also including means defining a raised cam edge at said second extreme position for responsively displacing said rod means from said advanced position and into said displaced position when said sector plate means is pivotally moved in said one pivotal direction and into said second extreme position, said rod means abutting against said second limit arm when said sector plate means is in said second extreme position; and

transfer arm means having one end pivotally connected to said bracket so as to be pivotal in said first and second pivotal directions about said pivot axis, the other end of said transfer arm means defining a holding portion positioned laterally of said slot relative to said second pivotal direction,

said transfer arm means including spring means exerting a bias force tending to pivot said transfer arm means in said first pivotal direction, and stop means projecting forwardly of said holding portion relative to said first pivotal direction and engageable with said first limit arm,

said holding portion being in registry with said rod means which said rod means is in said displaced position at said second extreme portion of said sector plate means which permits said transfer arm means to pivot in said first pivotal direction thereby releasably capturing said rod means

in said holding portion to releasably maintain said rod means in said displaced position, said sector plate means being thereafter freely pivotal from said second extreme position to said first extreme position in said second pivotal direction,

said stop means for engaging said first limit arm during a latter portion of pivotal movement of said sector plate means from said second extreme portion to said first extreme position, said first limit arm responsively pivoting said transfer arm means upon continued pivotal movement of said sector plate in said second pivotal direction to release said rod means from said holding portion to thereby enable said biasing means to move said rod means from said displaced position and into said advanced position such that said rod means abuts against said first limit arm whereby said sector plate is in said first extreme position.

4,558,904

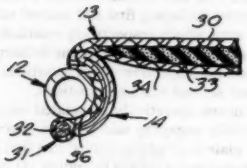
HOOP CHAIR

Moses R. Schultz, Box 52, Barto, Pa. 19504

Filed Mar. 23, 1983, Ser. No. 478,081

Int. Cl.[4] A47C *7/00*

U.S. Cl. 297—441 **13 Claims**



1. A chair comprising:

a metal frame component substantially defining the periphery of a chair seat or back;

upholstery means, having a fabric body portion forming a seat or back of the chair, and a welt formed around substantially the periphery of said body portion, said welt comprising a flexible, but relatively incompressible material, such as rope or cord, operatively attached to the fabric around the periphery thereof;

clamping means for cooperating with the frame component for holding the upholstery means to the frame so that the welt is on the opposite side of the clamping means and frame from the upholstery means body portion, said clamping means including a clamping component having a peripheral configuration cooperating with the frame component to operatively hold said upholstery means therebetween; and

means for supporting said frame component off the ground.

4,558,905

SEAT FOR VEHICLES

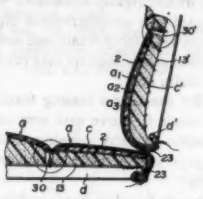
Takashi Natori, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Feb. 23, 1984, Ser. No. 583,034

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **4 Claims**

1. A seat for use in vehicles comprising a top layer member, a fixing member provided within said seat, heating elements within said top layer member, a cover member enclosing said heating elements, said cover member being extended to form an integral hang portion, and means for securing said hang portion to said top layer member, said hang portion being hung in and fixed to said fixing member, wherein said hang portion



includes a tip end formed in a bag-like configuration and a wire inserted through said bag-like configuration.

4,558,906

SHIELD MACHINE

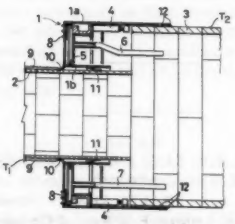
Shigeo Takamiya, and Toshio Furuta, both of Tokyo, Japan, assignors to Mitsui Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,364

Claims priority, application Japan, Dec. 3, 1982, 57-211354; Dec. 3, 1982, 57-211355

Int. Cl.[4] F21C *29/02*

U.S. Cl. 299—31 **10 Claims**



1. A shield machine for enlarging a portion of an existing tunnel comprising:

an inner and outer double cylinder shaped shield machine body including a cylindrical outer shield portion and a cylindrical inner guide portion adapted to be driven in an axial direction of an existing tunnel and along an outer circumferential surface of primary assembly segments lining the existing tunnel;

jack means for pushing forward the shield machine body by receiving a reaction force from a reaction member such as secondary assembly segments lining a constructed enlarged tunnel; and

a scraper means being positioned in front of the inner guide portion for removing a back-filling agent on said outer surface of said primary assembly segments before those segments are removed.

4,558,907

CONTROL VALVE DEVICE ARRANGED FOR DIRECT OR GRADUATED RELEASE OPERATION

John R. Reiss, N. Versailles, and Richard Katz, Plum Borough, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Aug. 20, 1984, Ser. No. 642,846

Int. Cl.[4] B60T *15/54*

U.S. Cl. 303—74 **7 Claims**

1. A fluid pressure controlled vehicle brake apparatus comprising:

(a) a brake pipe normally charged with fluid under pressure to a certain chosen value;

(b) a control reservoir normally charged with fluid under pressure at said certain chosen value;

(c) fluid pressure operated brake means for braking said vehicle;

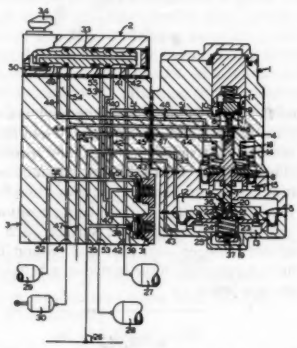
(d) a brake control service valve device operative in response to variation of said brake pipe fluid under pressure comprising:

(i) a movable main piston abutment subject on one side to said brake pipe fluid under pressure and on the opposite side to said control reservoir fluid under pressure;

(ii) a piston stem engageable at one end with said main piston abutment;

(iii) valve means engageable with the other end of said piston stem for connecting fluid under pressure from said control reservoir to said brake means when said main piston abutment is actuated in a first direction in response to a reduction of said brake pipe pressure;

(iv) a first passageway via which fluid under pressure is connected from said control reservoir and said opposite side of said main piston abutment to said valve means to effect pressurization of said brake means; and



(v) spring means for biasing said main piston abutment in a direction opposite said first direction toward a lap position in which said connection of said control reservoir fluid under pressure with said brake means is interrupted when said control reservoir fluid under pressure is reduced to a value that exceeds the reduced brake pipe fluid under pressure by an amount sufficient to exert a differential force on said main piston abutment to counterbalance the bias force exerted by said spring means;

wherein the improvement comprises:

(e) a one-way differential check valve in said first passageway via which said control reservoir fluid under pressure is supplied to said brake means by said valve means when said main piston abutment is actuated; and

(f) a fluid pressure charged service reservoir connected to said first passageway downstream of said differential check valve so as to supply fluid pressure to said brake means in parallel with said control reservoir in bypass of said differential check valve.

4,558,908

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS OR THE LIKE

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Hochst, Austria

Filed Apr. 13, 1984, Ser. No. 599,826

Claims priority, application Austria, May 3, 1983, 1607/83

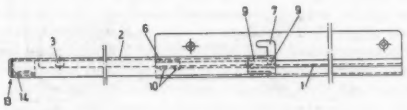
Int. Cl.⁴ F16C *21/00*; A47B *88/00*

U.S. Cl. 308—3.8 **8 Claims**

1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein the drawer is sidably insertable into and removable from a furniture body, said assembly comprising:

a supporting rail adapted to be mounted on a side portion of a furniture body, said supporting rail having a horizontal flange and vertical flanges extending from opposite sides of said horizontal flange;

a pull-out rail adapted to be mounted on the bottom of a drawer, said pull-out rail having a horizontal flange and vertical flanges extending from opposite sides of said horizontal flange;



a first slide fixed to a front end of said supporting rail, said horizontal flange of said pull-out rail slidably contacting said first slide;

a second slide fixed to a rear end of said pull-out rail, said second slide embracing said horizontal flange of said supporting rail and thereby preventing tilting of said pull-out rail relative to said supporting rail; and

a roller carrier slidably mounted between said supporting and pull-out rails, said roller carrier supporting compensating rollers rotatable about vertical axes and rollingly contacting said vertical flanges of said supporting and pull-out rails.

4,558,909

AIR BEARING BODY

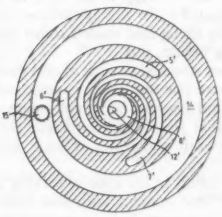
Siegfried T. Stauber, Zurich, Switzerland, assignor to Wyler AG., Switzerland

Filed Mar. 20, 1984, Ser. No. 592,345

Claims priority, application Switzerland, Mar. 30, 1983, 1774/83

Int. Cl.⁴ F16C *29/02, 32/06*

U.S. Cl. 308—5 R **7 Claims**



1. An air bearing for slide guides, comprising:

a non-rotatable body including a planar bearing surface having a center portion and an outer periphery;

an air supply aperture opening on said center portion of said bearing surface for supplying air pressure from an external source to said bearing surface; and

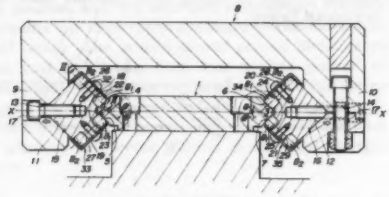
a plurality of shallow air circulation ducts opening on said bearing surface, an uneven number of said ducts being provided, said ducts extending along spiral paths with spiral arcs of at least 360° from and in fluid communication with said aperture, each of said ducts having a transverse cross-sectional configuration with a relatively low height in a direction perpendicular to said bearing surface and having an end spaced at a distance from said outer periphery of said bearing surface, said transverse cross-sectional configuration of each of said air circulation ducts having an area which increases with increasing distance from said air supply aperture.

4,558,910

LINEAR SLIDE ROLLER BEARING UNIT

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,723
Claims priority, application Japan, May 26, 1983, 58-92015
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 308—6 C **9 Claims**



1. A linear slide roller bearing unit comprising:

a track shaft extending in the longitudinal direction of said linear slide roller bearing unit and having loaded roller rolling surfaces respectively formed on the upper and lower inclined surface portions of each of the right and left ridges thereof projecting horizontally;

a movable table constituted by a long block member disposed so as to straddle said track shaft, said movable table having longitudinal V-shaped grooves respectively formed in the opposing inner surfaces of skirt portions thereof;

a pair of right and left bearing bodies each constituted by a long block member of substantially square cross-section which is screwed to the corresponding V-shaped groove in said movable table, each bearing body having a guide ridge projecting from the center of each inner inclined surface portion of said block member, each guide ridge having one side surface thereof defined as a loaded roller rolling surface confronting the corresponding loaded roller rolling surface of said track shaft and the other side surface defined as a non-loaded roller rolling surface;

barrel-shaped rollers adapted to be recirculated along said loaded roller rolling surfaces and non-loaded roller rolling surfaces of said bearing bodies and to come in contact with said loaded roller rolling surfaces on said track shaft when rolling along said loaded roller rolling surfaces on said bearing bodies; and

a roller retainer attached to each of said guide ridges so as to face the corresponding inner inclined surface portion of the associated bearing body and adapted to guide said rollers so that they can recirculate through the space defined between said roller retainer and inner inclined surface portion,

wherein said rollers in the state of serving as loaded rollers are brought into contact with said loaded roller rolling surfaces on said track shaft at a contact angle of about 45° with respect to the horizontal axis passing through both the centers of said right and left ridges of said track shaft.

4,558,911

ROLLING CONTACT ROBOT JOINT

Carl F. Ruoff, La Crescenta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Dec. 21, 1983, Ser. No. 564,470
Int. Cl.⁴ H01R *39/02*
U.S. Cl. 339—5 M **7 Claims**

1. An electromechanical robotic joint member comprising:

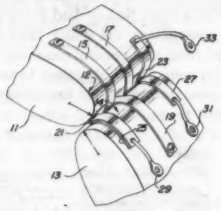
first and second separate link members for the robotic joint, with said members having respective oppositely disposed joint surfaces adjacent to and facing one another with at least one of said joint surfaces being curved;

a plurality of flexible and electrically-conductive bands for structurally joining the separate link members into an articulate joint and for varying an electrical resistance as said link members, so joined, are articulated in rolling contact with respect to one another, said plurality of bands characterized by:

first band means mounted on the upper surface of said first link member and the under surface of said link member;

second band means mounted on the upper surface of said second link member and on the under surface of said first link;

a first conductive surface mounted on one of said first and second link members, said first conductive surface exhibiting a selected impedance characteristic and having a first terminal contact point; and



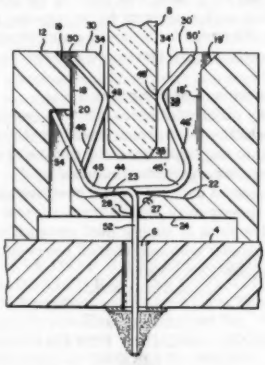
a second flexible conductive surface having a second terminal point and also mounted on one of said first and second link members and held by said first and second band means in rolling contact with said first conductive surface and positioned to wrap onto and unwrap therefrom, said second flexible conductive surface being positioned to roll on and off said first conductive surface such that relative movement between said first and second link members produces a variation in the impedance between said terminal contact points.

4,558,912

EDGE CONNECTOR FOR CHIP CARRIER

James R. Coller, Kernersville, and Roger L. Thrush, Clemmons, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1983, Ser. No. 561,392
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—64 M **9 Claims**



1. A socket for receiving the edge of a substrate comprises:

an elongate dielectric housing having a substrate receiving face with an elongate substrate receiving channel therein, said channel being substantially symmetric about a central plane, said channel being interrupted by equally spaced partitions having respective mutually aligned U-slots therethrough which open on said face, each said U-slot

being profiled by a pair of opposed sidewalls and a floor, said channel being defined by a pair of opposed sidewalls and a floor and further comprising a plurality of contact receiving cavities separated by said partitions, said floor of said channel having a plurality of elongate apertures therethrough in respective cavities, said apertures being aligned along said central plane, said apertures each having a chamfered lead-in in said floor of said channel, said floor of said channel having a convex portion in each said cavity, the apex of each convex portion being along said central plane,

a like plurality of stamped and formed generally U-shaped metal contacts located in respective cavities, each contact comprising a contact section having a base and a pair of directly opposed arms formed upward from said base, said contact further comprising a pin formed downward from said base of said contact section and extending into a respective aperture, said base having a rolled surface facing the convex portion of said floor of said channel, said arms being formed with respective mutually facing convex rolled contact surfaces, said pin having rolled surfaces which are parallel to said central plane, the forming axes all being mutually parallel and parallel to said central plane, said arms deflecting away from each other to accommodate said substrate between said contact surfaces thereon, said contact section as a whole deflecting laterally to accommodate offsetting of said substrate from said central plane, said pin deflecting in said lead-in of said aperture, said lateral deflection of said contact section as a whole being limited by the sidewalls of said U-slots.

4,558,913

ELECTRICAL CONNECTOR

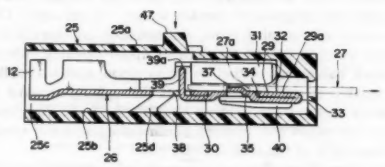
Moritaka Goto, and Takahito Kameoka, both of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,405

Claims priority, application Japan, May 18, 1982, 57-83738; Dec. 23, 1982, 57-202190[U]

Int. Cl.⁴ H01R *11/22*

U.S. Cl. 339—74 R **4 Claims**



1. An electrical connector comprising:

(a) a female member of an electrically-conductive metal plate including an elongated body having a flat base portion and a pair of opposed resiliently deformable retaining arms formed integrally on said base portion and extending along opposite lateral edges thereof to form a retaining portion of a generally channel-shaped cross-section, each of said retaining arms having a side portion extending from said base portion and a distal end portion extending from said side portion, and said side portions of the respective retaining arms being inclined inwardly toward each other; and

(b) a male member of an electrically-conductive metal plate having a flat end portion adapted to be inserted into said retaining portion for being resiliently held by said retaining arms and said base portion to make an electrical connection between said female and male members, said base portion being reversely folded over on itself at one end thereof to form a folded portion, said base portion having a first aperture formed therethrough and disposed at said retaining portion, said foled portion having a lock tongue received in said first aperture and extending into said retaining portion, said male member having a retaining aperture formed through said flat end portion thereof so that upon insertion of said flat end portion into said retaining portion, said lock tongue is fitted in said retaining aperture to retain said male member against movement relative to said female member, and said folded portion having a pair of longitudinal reinforcing ribs formed on opposite lateral edges thereof at one surface facing away from said base portion, said base portion having a second aperture formed therethrough and disposed adjacent to said folded portion, said base portion being reduced in width at its forward end disposed in contiguous relation to said folded portion so as to be resiliently deformable and said folded portion having its free end directed upwardly toward said retaining portion to form a lug which is received in said second aperture whereby, upon depression of said lug, said base portion is resiliently deformed at its reduced section to move said lock tongue in a direction away from said retaining portion.

4,558,914

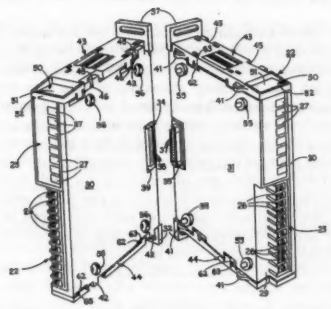
READILY EXPANDABLE INPUT/OUTPUT CONSTRUCTION FOR PROGRAMMABLE CONTROLLER

Jay M. Prager, Nashua, N.H., and Roman Y. Gonzales, Andover, Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 23, 1982, Ser. No. 422,268

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 339—75 R **6 Claims**



1. Input/output modules interconnectable with a central processor to form a machine controller for receiving information from and providing operating instructions to external devices, and interconnectable with adjacent previously mounted input/output modules, each of said input/output modules comprising

A. a housing having a substantially regular parallelepiped shape and incorporating

a. first connector means for communicating with the external devices, and

b. second connector means adapted for electronic engagement with a mating connector for communicating with the central processor;

B. post means extending from an external surface of said housing; and

C. two slider members, each of which comprises mirror images of the other and are

a. movably mounted on opposite surfaces of the housing,

b. movable between a first disengaged position and a second post-engaged locking position, and

c. incorporating interconnecting, locking finger means extending therefrom, positioned for locking engagement with the post means of an adjacent module when the slider is moved from its first disengaged position to its second engaged, locked position;

whereby input/output modules are quickly and easily securely mounted to, or disengaged from, each other, providing a programmable controller capable of being expanded, or repaired, rapidly and efficiently.

4,558,915

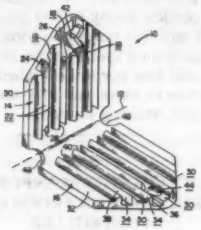
ELECTRICAL CONNECTOR

William S. Greenwood, Nutley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 21, 1980, Ser. No. 123,490

Int. Cl.⁴ H01R *11/20*

U.S. Cl. 339—97 C **17 Claims**



1. An electrical connector for making electrical contact to a conductor, comprising:

a bendable member for bending along a bending line, said member including a first arm portion and a second arm portion separated from one another by said bending line; and

a pair of teeth extending outwardly from and along a surface of each arm portion, each pair of teeth being spaced by a slot extending within the respective surfaces of said arm portions, the opposing sidewalls of said slot defining a planar surface of each said spaced teeth, each tooth having a nonplanar surface converging with a planar surface to define a sharp edge thereat, said slots in the respective arm surfaces being offset relative to each other such that in the bent configuration one of said teeth on each arm portion lies facingly between the teeth on the other arm portion with the nonplanar surface of such one tooth being facingly more proximate a planar suface of one of the opposing teeth on the other arm portion.

4,558,916

MULTI-PIN PLUG CONNECTION SYSTEM FOR ELECTRONIC CONTROL UNIT

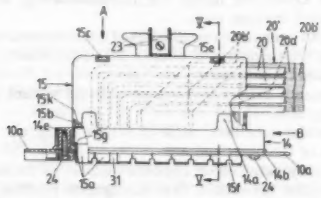
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,174

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3235950; Apr. 29, 1983, 3315688

Int. Cl.⁴ H01R *23/66, 13/506*

U.S. Cl. 339—107 **23 Claims**



1. A multi-pin plug connector system for the selective and joint connection of single and multiple unequally constituted multi-conductor cables of the round type and of the ribbon type to the contact sockets of a standardized multiconductor socket bar, the multi-pin plug connector system, defined hereinafter in an orientation for vertical plugging engagement, comprising in combinations:

a plug connector including a plug connector housing of injection-molded plastic material, the connector housing forming in its lower portion a housing pocket with elongated, generally rectangular upper and lower openings defined by two substantially vertically oriented longitudinal pocket walls with horizontal upper and lower edges and by two substantially vertically oriented transverse pocket walls, the connector housing forming in its upper portion two shell halves which are attached to the upper edges of the longitudinal pocket walls by means of integral bending hinges and pivotable about said bending hinges between an open position and a closed position, the housing pocket being adapted for the selective accommodation and retention therein of a pin bar assembly of standardized horizontal length which is selectively composed of a single full-length plug unit and of a variable number of fractional-length plug units arranged end-to-end and in line with each other;

at least one plug unit arranged in the housing pocket;

a plurality of parallel, vertically oriented and horizontally regularly spaced metallic contact posts arranged in each plug unit, the contact posts having lower end portions in the form of contact pins which protrude downwardly from the plug unit, being engageable into the contact sockets of said socket bar;

a plurality of electrical conductors connected to the contact posts at their upper end portions, the electrical conductos forming part of at least one multi-conductor cable entering the plug connector housing in the area of a joint line formed by its closed shell members; and

means for positioning the multi-conductor cable, or cables, respectively, on the inside of the plug connector housing; and wherein

the housing pocket has on the inside of its longitudinal pocket walls upwardly facing seating shoulders;

the shell halves have in the vicinity of their bending hinge attachment to the upper edges of said pocket wall retaining shoulders which, in the closed position of the shell halves, face downwardly and protrude laterally inwardly over the longitudinal pocket walls;

the plug unit, or plug units, respectively, are insertable into the housing pocket through its upper opening, when the shell halves are in their open position, and vertically securable in the housing pocket through downward abutment against the seating shoulders of the longitudinal pocket walls and upward abutment against the retaining shoulders of the shell halves; and

the plug unit, or plug units, respectively, and the two longitudinal pocket walls form vertically oriented key-and-groove profiles of the dovetail-type which produce a transverse attachment between the plug units and the longitudinal pocket walls.

4,558,917

ELECTRICAL CONNECTOR ASSEMBLY

Takashi Kamono, Yokohama, and Hiromi Yamada, Yokosuka, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 520,409, Aug. 5, 1983, abandoned. This application Sep. 20, 1984, Ser. No. 652,431

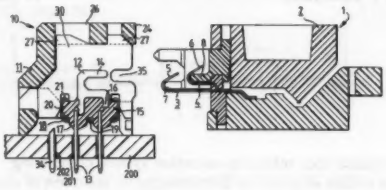
Claims priority, application United Kingdom, Sep. 7, 1982, 8225426

Int. Cl.⁴ H01R *13/648*

U.S. Cl. 339—143 R **14 Claims**

1. An electrical connector assembly for use in terminating shielded electrical cable of the type comprising a plurality of conductors arranged in a spaced, parallel, planar array in a sheet of insulating material, certain of the conductors, in use, constituting ground conductors positioned between signal conductors in the array, the assembly comprising a first con-

nector comprising a housing of insulating material carrying a plurality of contacts for connection to respective conductors of a cable, and a second connector comprising a housing of insulating material carrying a plurality of contacts matable with the contacts of the first connector when the connectors are mated, and having portions connectable to other external circuitry, wherein contacts in the housing of the second connector are separated by shielding plates each formed of conductive material and having a layer of insulating material on both major surfaces, the shielding plates being adapted for mating with contacts of the first connector to be connected to ground conductors of the cable, and being interconnected in the second connector by a ground bus member carried by the housing of the second connector, at least one of the shielding plates having a portion connectable to other external circuitry.

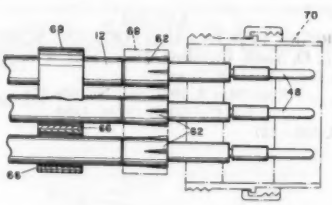


4,558,918

CABLE SHIELD TO CONNECTOR TERMINATION DEVICE

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Nov. 28, 1984, Ser. No. 675,790
Int. Cl.[4] H01R *13/658*
U.S. Cl. 339—143 R **7 Claims**



1. A cable shield to connector back shell termination device for receiving the end of a shielded cable, said device comprising:

a back shell of a multi-pin cable connector;

a cluster of a multiple of metallic tubes conductively bonded together and shaped to fit said back shell for conductive bonding to said back shell;

a plurality of said tubes adapted to receive individually the ends of a shielded cable such that substantially full circumferential conductive contact is maintained between each cable shield and its tube; and

means for conductive connection of each cable shield with a corresponding tube;

wherein said means for connection comprises:

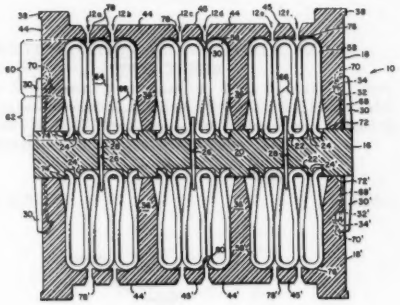
a conductive sleeve for conductive mounting on said cable shield and for conductive frictional engagement with said tube.

4,558,919

MULTIPLE ELECTRICAL CONNECTOR AND BLOCK HAVING A BACK TO BACK CONFIGURATION

Karl-Heinz Pohl, Buffalo, Minn., assignor to The Siemon Company, Watertown, Conn.

Filed Sep. 29, 1983, Ser. No. 537,067
Int. Cl.[4] H01R *13/50*
U.S. Cl. 339—206 R **16 Claims**



1. A block for housing electrically conductive wire-formed connector elements of the type having oppositely facing and interconnected upper and lower rows of loops, the block including:

a connecting retainer section, said retainer section having opposite first and second surfaces;

a plurality of rows of spaced slots in said retainer section first surface and a corresponding plurality of rows of spaced slots in said retainer section second surface;

at least some of said spaced slots on said opposite surfaces of said retainer section being provided with apertures and spacers, said apertures and said spacers each being positioned so as to be equidistant from the centers of an adjacent pair of loops of a connector element, said apertures communicating with said retainer section second surface, each of said spacers being a protrusion which will be positioned between and in contact with two adjacent lower loops of one of said connector elements;

at least one elongated electrically conductive pin means, said pin means being positioned and retained within said apertures of said spaced slots, portions of said pin means extending outwardly beyond both of said first and second surfaces of said retainer section, said portion of said pin means extending from said first surface of said connecting retainer section adapted for positioning between and in electrical contact with two adjacent lower loops of a first one of said electrically conductive wire connector elements, said portion of said pin means extending from said second surface of said connecting retainer section adapted for positioning between and in electrical contact the two adjacent lower loops of a second one of said electrically conductive wire connector elements;

a pair of main body sections;

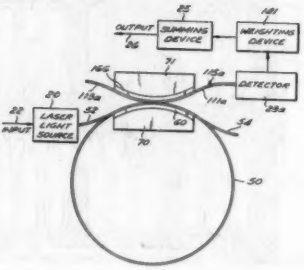
one of said main body sections being adapted to retain at least a first one of said connector elements and the other of said main body sections being adapted to retain at least a second one of said connector elements; and

means for releasably joining said pair of main body sections together to said opposite first and second surfaces of said connecting retainer section.

4,558,920
TAPPED OPTICAL FIBER DELAY LINE

Steven A. Newton, Menlo Park, and John E. Bowers, Mountain View, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 19, 1981, Ser. No. 323,038
Int. Cl.[4] G02B 5/172
U.S. Cl. 350—96.15 40 Claims



29. A tapped optical fiber delay line for sampling a light signal supplied to said tapped delay line, comprising:

a length of single mode optical fiber;

a base forming a platform for holding multiple segments of said fiber, each of said fiber segments being mounted at a predetermined height by said base;

multiple taps in said multiple fiber segments, each of said taps comprising a portion of a fiber segment at which the height of said optical fiber has been reduced to a predetermined distance above said base, and wherein the length of said fiber between adjoining tap locations in said segments is equal;

means for detecting a light signal supplied to said tapped delay line at each tap location; and

means for summing the light detected at all tap locations to produce an output signal comprising the system-set fundamental and harmonic frequency content of the input signal, the system-set fundamental frequency being that frequency having a period equal to the time required for a signal to travel said equal length between adjoining tap locations.

39. A method of manufacturing couplers, comprising:

mounting multiple first segments of single mode optical fiber into multiple parallel arcuate recesses on a first base;

gradually longitudinally removing cladding simultaneously from a portion of said first segments to simultaneously produce an optical tap in each of said first segments;

mounting multiple second segments of single mode optical fiber into parallel arcuate recesses on a second base;

gradually, longitudinally removing cladding simultaneously from a portion of said second segments to simultaneously produce an optical tap in each of said second segments;

juxtaposing plural ones of the optical taps with plural others of the optical taps, thereby creating a multiplicity of optical couplers; and

cutting said bases to separate a plurality of the optical taps.

4,558,921
SOLITON FIBER TELECOMMUNICATION SYSTEMS

Akira Hasegawa, New Providence, and Yuji Kodama, Plainfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 352,330, Feb. 25, 1982. This application Feb. 14, 1985, Ser. No. 701,654
Int. Cl.[4] G02B 5/14
U.S. Cl. 350—96.29 10 Claims

1. Optical fiber telecommunication system comprising

(a) a source of pulses of electromagnetic radiation of carrier wavelength λ_o;

(b) a fiber transmission channel having an input location and an output location spaced apart from the input location, the channel comprising optical fiber that is single mode fiber for radiation of wavelength λ_o and has anomalous dispersion in a wavelength region containing λ_o; and

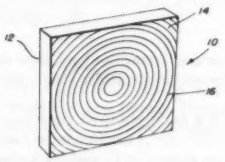
(c) means for coupling at least one pulse into the channel at the input location and means for detecting the pulse at the output location, the pulse being transmitted through the channel from the input to the output location; the pulse having a peak power and a pulse width, the single mode fiber having loss at the wavelength λ_o, the loss resulting in a decrease of the peak power of the pulse with increasing distance from the input location, the system further comprising

(d) nonelectronic means, located intermediate the input location and the output location, for increasing the peak power of the pulse and for simultaneously decreasing the pulse width of the pulse, whereby the merging of the pulse with an adjacent pulse can be substantially prevented, "nonelectronic means" being means in which a pulse is present at all times in form of a pulse of electromagnetic radiation, and is never present in form of an electron pulse.

4,558,922
BRIGHT VIEWING AND FOCUSING SCREENS

Harry L. O. Smith, Cleveland, Tenn., assignor to Beattie Systems, Inc., Cleveland, Tenn.

Filed May 9, 1984, Ser. No. 608,474
Int. Cl.[4] G03B 13/24, 2/60
U.S. Cl. 350—127 4 Claims

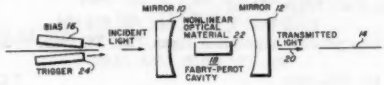


1. An image forming screen for optical systems comprising a substantially rectangular body formed from an optical grade of synthetic plastic material having spaced exterior surfaces, one of said surfaces comprising a series of concentric rings forming a Fresnel lens, and the other surface comprising the image surface, said image surface having a replica of a ground glass surface, said image surface being coated with a void filling thin layer of optically clear material having an index of refraction of about 1.55 to 1.65 and at least a 95 percent transmission of visible spectrum light.

4,558,923
PICOSECOND BISTABLE OPTICAL SWITCH USING TWO-PHOTON TRANSITIONS

Craig A. Hoffman, Arlington, Va.; Jerry R. Meyer, Baltimore, and Filbert Bartoli, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1983, Ser. No. 564,623
Int. Cl.[4] G02F *1/015, 1/35*
U.S. Cl. 350—354 **17 Claims**



1. A bistable optical device with switching times in the picosecond range comprising:

an optical resonator with an optical resonant cavity therein and including means for extracting a light output beam from said optical resonant cavity,

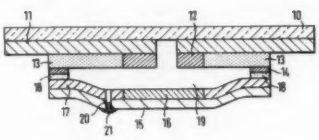
a nonlinear material which is essentially optically transparent disposed in said optical resonant cavity, said nonlinear material having a conduction band and at least an upper and a lower valence bands with an energy spacing therebetween such that a two-hw photon transition can occur from a non-minimum energy location in said upper valence band to said conduction band, and a one-hw photon virtual transition at a non-minimum energy can occur between said upper and lower valence bands, said nonlinear material having an optical length which depends on the intensity of light in said optical resonant cavity; and

means for pumping photon energy hw in the range $\frac{1}{2}\Delta_g < hw < \Delta_g$ into said optical resonant cavity in order to stimulate said virtual transition via the two-photon transition, where Δ_g is the bandgap between the upper valence band and the conduction band of said nonlinear material.

4,558,924
ELECTROCHROMIC INDICATOR DEVICE ASSEMBLED WITH AN ADHESION PROMOTING LAYER

Helmut Sautter, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,618
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211651
Int. Cl.[4] G02F *1/23*
U.S. Cl. 350—357 **20 Claims**



1. Electrochromic indicating device comprising:

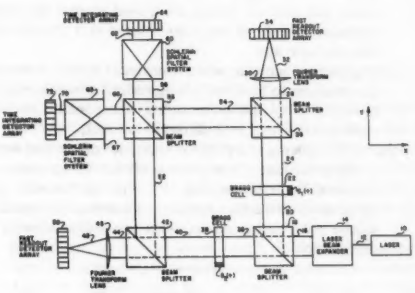
first and second electrodes facing each other across a cavity filled with an electrolyte, said first electrode being composed of an oxide of a transition metal and supported by a surface of a transparent or translucent substrate wherein a conducting layer is interposed between said first electrode and said substrate for supply of current to said first electrode and a protection layer is provided on said conducting layer, surrounding said first electrode and on a region not covered by said first electrode, said second electrode being a counter electrode provided as a layer on a second substrate which is a metallic substrate, said substrates being joined together around said electrolyte-filled cavity by an adhesive bonding material applied in a region between said protection layer and said metallic substrate, said device further comprising:

an adhesion-promoting layer **(14, 17)** consisting essentially of at least one substance selected from a group which consists of polyvinyl alcohol and polyvinyl butyral and applied on at least a surface of the metallic substrate in the region where the substrates are to be bonded with each other, said adhesion promoting layer being interposed at least between the metallic substrate upon which it is applied and a film of the adhesive bonding material **(18)** applied between the substrates for bonding them together.

4,558,925
MULTI-FUNCTION ACOUSTO-OPTIC SIGNAL PROCESSOR

Michael W. Casseday, Washington, D.C.; Norman J. Berg, Baltimore, and Andree N. Filipov, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1984, Ser. No. 637,173
Int. Cl.[4] G02F *1/33;* **G06G** *9/00*
U.S. Cl. 350—358 **13 Claims**



1. A device, comprising:

a. means for producing a laser beam;

b. means to expand said laser beam;

c. first beam splitter means for splitting said expanded laser beam into first and second beams;

d. first means for diffracting said first beam;

e. second means for diffracting said second beam;

f. second beam splitter means for splitting said diffracted first beam into third and fourth beams;

g. third beam splitter means for splitting said diffracted second beam into fifth and sixth beams;

h. a first Fourier transform lens system disposed in the path of said third beam;

i. a second Fourier transform lens system disposed in the path of said sixth beam;

j. first detector means disposed at the back focal plane of said first Fourier transform lens system;

k. second detector means disposed at the back focal plane of said second Fourier transform lens system;

l. fourth beam splitter means for combining said fourth and fifth beams and for splitting the combined beams into seventh and eighth beams;

m. first Schlerin spatial filter means disposed in the path of said seventh beam for filtering undiffracted light from said seventh beam;

n. second Schlerin spatial filter means disposed in the path of said eighth beam for filtering undiffracted light from said eighth beam;

o. third detector means disposed in the output of said first Schlerin spatial filter; and

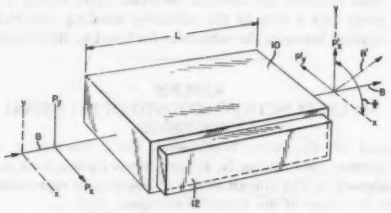
p. fourth detector means disposed in the output of said second Schlerin spatial filter.

4,558,926

ACOUSTO-OPTIC BEAM DEFLECTOR

Joel C. Johnson, Lake Oswego, Oreg., assignor to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Jan. 20, 1983, Ser. No. 459,303
Int. Cl.⁴ G02F *1/11*
U.S. Cl. 350—373 **10 Claims**



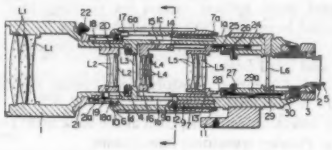
1. An acousto-optic beam deflector, comprising:
an optically active stress optic medium that receives an optical beam having first and second polarization components, the medium being positioned so that the polarization components of the beam rotated as it travels through the medium; and
a longitudinal acoustic wave transducer which is coupled to the medium to produce a longitudinal acoustic wave that interacts with the polarization components to diffract each one of them by a different amount,
the medium being of a predetermined length so that each one of the polarization components rotates by an amount that substantially compensates for the difference in the amounts of diffraction, thereby to develop an optical beam whose polarization components are deflected with equal efficiencies.

4,558,927

ZOOM LENS ASSEMBLY

Sachio Omori, Yokosuka; Hideshi Naito, Tokyo; Hitoshi Imanari, Funabashi, and Takeshi Muryoi, Chigasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,364
Claims priority, application Japan, Aug. 21, 1982, 57-125514[U]
Int. Cl.⁴ G02B *7/10, 15/18*
U.S. Cl. 350—429 **10 Claims**



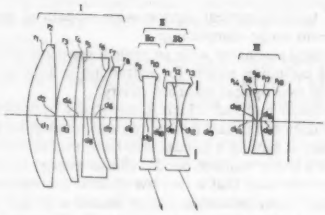
1. A zoom lens assembly comprising:
(a) an optical system including, in succession from the object side, a stationary lens group, a first movable lens group, a second movable lens group and a third movable lens group;
(b) a stationary barrel for holding said stationary lens group;
(c) first, second and third movable barrel members disposed on said stationary barrel for holding and axially moving said first, second and third movable lens groups, respectively;
(d) an operating member slidable in the direction of the optical axis with respect to said stationary barrel for zooming, and rotatable about the optical axis for focusing;
(e) first means for moving said first movable barrel member in response to the rotation of said operating member; and
(f) second means for moving said second and third movable barrel members in response to the sliding movement of said operating member.

4,558,928

FOCUSING METHOD FOR A TELEPHOTO LENS SYSTEM

Masaki Imaizumi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,196
Claims priority, application Japan, Dec. 24, 1982, 57-226387
Int. Cl.⁴ G02B *9/64, 13/02*
U.S. Cl. 350—454 **7 Claims**



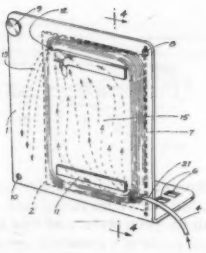
1. A focusing method for a telephoto lens system comprising a front lens group having positive refractive power, an intermediate lens group having negative refractive power, and a rear lens group having positive refractive power, said focusing method for a telephoto lens system being arranged to divide said intermediate lens group into a first subunit and a second subunit and to focus said telephoto lens system by moving both of said subunits toward the image side by varying the distance between said subunits.

4,558,929

NON-FOGGING MIRROR

John A. Stephens, and Martin Stephens, both of 95 Rochester St., Sydney, New South Wales, Australia

Filed Jan. 26, 1984, Ser. No. 574,074
Int. Cl.⁴ G02B *7/18*
U.S. Cl. 350—588 **2 Claims**



1. A non-foggable mirror assembly for use in a shower comprising a mirror having a reflective surface and a back surface; a chamber in heat exchange relationship with substantially the entire said back surface, the chamber having upper and lower ends and having an inlet port at the lower end and a continuously open outlet port at the upper end; adapter means for connection to a water pipe leading to a shower head for tapping off heated water from the water pipe; and means connected between said adapter means and the inlet port for con-

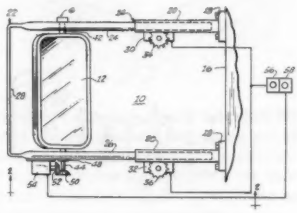
ducting heated water from said adapter means into the chamber through said inlet port, whereby heated water flows upwardly through said chamber from the inlet port to the outlet port, and said reflective surface is continuously heated by the water to prevent fogging.

4,558,930

TRUCK MIRROR ADJUSTABLE IN THE HORIZONTAL DIRECTION

Harold Deedreek, 5741 SW 37 Ct., Davie, Fla. 33314

Filed Apr. 4, 1984, Ser. No. 596,820
Int. Cl.[4] G02B *7/18, 5/08*
U.S. Cl. 350—604 **7 Claims**



1. A side mirror for a vehicle which is controllably adjustable inward or outward from said vehicle comprising:

a mirror affixed to an upper and lower horizontal member,

a pair of tubes affixed to said vehicle and positioned and sized so that said horiontal members slide therein,

means including a rack and pinion, for moving said upper and lower horizontal members slideably within said tubes,

motor means for controllably driving said pinions in one of two directions; and

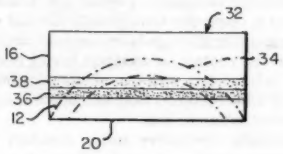
control means for controlling said motor means to drive said pinions and the direction in which said pinions are driven.

4,558,931

COLORED SOFT CONTACT LENS

Ari Fuhrman, Miami Beach, Fla., assignor to Color Optics, Ltd. (Partnership), Scarsdale, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,914
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—160 H **3 Claims**



1. A cosmetic contact lens in the shape of a circular segment of a sphere and having a circular edge, comprising stacked, fused clear and colored layers of a water swellable hydrophilic crosslinked polymer of 2-hydroxyethylmethacrylate, with a pupillary area formed in a central zone thereof from a clear layer, a secondary zone formed about said central zone at least partly from one or more colored layers, and a peripheral zone formed about the secondary zone from a clear layer,

each of said layers being formed from the same polymer, and said colored layers and at least one clear layer being disposed in overlapping relationship and parallel to the circular edge of the lens; and

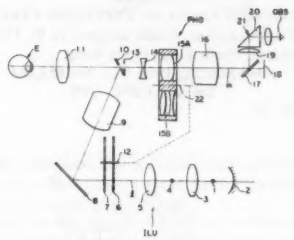
said lens being sized and shaped to be worn on the eye with said central zone registering with the pupil of the eye and said secondary zone covering the iris of the eye, the construction of said lens providing concentric circles of color which are diffused and blended together where the adjacent layers are in overlapping relationship.

4,558,932

VARIABLE IMAGE MAGNIFICATION EYE FUNDUS CAMERA

Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,995
Claims priority, application Japan, Sep. 16, 1982, 57-159427
Int. Cl.[4] A61B *3/14;* **B03B** *29/00*
U.S. Cl. 351—206 **7 Claims**



1. An eye fundus camera comprising:

a first optical system for illuminating the fundus of the eye to be inspected, including at least one light source, and an annular aperture which is provided at a position optically conjugate with the iris of the eye and through which the light emitted from said light source is directed toward the eye so that an image of said annular aperture is formed at or near the iris;

a second optical system for making a photograph of the eye fundus illuminated by said first optical system, including a variable magnification lens system for varying the image magnification; and

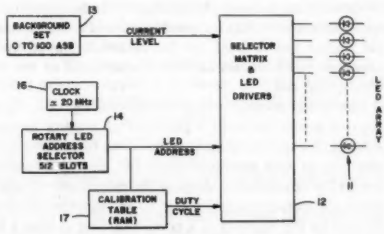
means for adjusting the size of said image of said annular aperture, including means for adjusting the inner diameter of said image for providing a smaller image inner diameter when the magnification of the variable magnification lens system is increased.

4,558,933

METHOD AND APPARATUS FOR UNIFORM BACKGROUND IN VISUAL FIELD TESTING DEVICES

William C. Murr, Piedmont, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 31, 1983, Ser. No. 499,313
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—226 **17 Claims**



1. A device for providing a uniform testing field for a visual field mapping device which includes a concave viewing screen

and a plurality of selectively illuminated test points spaced thereabout, comprising:

means for illuminating said viewing screen at a selectively variable luminance level;

means for sequentially selecting and illuminating said test points to determine the visual response of a subject; and

means for strobing the test points not currently selected by said means for sequentially selecting at a rate and intensity so that the luminance of the non-currently selected test points is substantially equal to the screen luminance.

4,558,934

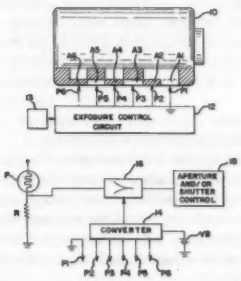
CAMERA EXPOSURE CONTROL SYSTEM

Arthur J. Winter, Encino, Calif., assignor to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Sep. 20, 1984, Ser. No. 652,081

Int. Cl.[4] G03B 7/00

U.S. Cl. 354—21 **21 Claims**



1. In an electrically operated camera configured to acceptingly receive a film-dispensing cassette, said camera having scene illumination sensing means for providing electrical illumination-indicating signals indicative of scene illumination, exposure control means responsive to said electrical illumination-indicating signals for automatically adjusting camera exposure in accordance with the magnitude of scene illumination including film speed control means for controlling the operation said exposure control means by a film speed correction control signal related to the speed of the film contained within said cassette, said film speed bring represented by a code displayed on the surface of said cassette, said code taking the form of a plurality of specified areas, each said specified area being characterized by at least a first and a second speed-indicating condition, said plurality of specified areas collectively constituting a generally precise coded representation of the film speed, the improvement wherein:

said code has the property that a numerical value can be assigned to each speed-indicating condition of each of said specified areas so that the product of said assigned numerical values represented by the codes displayed on said cassettes yields values closely proportional to the actual film speed; and

said film speed control means for controlling said exposure control means includes a plurality of sensing means for sensing the speed-indicating condition of at least a lesser plurality of said specified areas and analogue multiplier means for controllably varying the magnitude of said film speed correction control signal by analogue multiplication thereof by the product of a corresponding at least a lesser plurality of numerical values, each said value being proportional to that assigned to the sensed speed-indicating conditions to give at least an approximate film speed correction to said exposure.

4,558,935

CAMERA PROVIDED WITH MEANS FOR DETECTING INFORMATION ON FILM CARTRIDGE

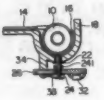
Sunao Ishizaka, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

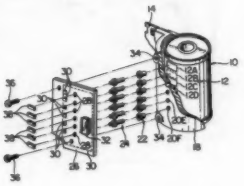
Filed May 24, 1984, Ser. No. 613,607

Claims priority, application Japan, May 30, 1983, 58-95188

Int. Cl.[4] G03B 7/00

U.S. Cl. 354—21 **7 Claims**





1. In a camera which can use a film cartridge having code indicia containing electrically conductive contacts and being indicative of one or more characteristics of the film contained in the cartridge, apparatus for detecting said code indicia comprising:

(a) a wall member forming a chamber for receiving said cartridge, said wall member having through-holes provided at positions opposed to said code indicia;

(b) a circuit substrate fixed to said wall member at a side of said wall member opposite to said chamber and having thereon an electric circuit means for reading the characteristics of said film, said circuit substrate having through-holes corresponding to said through-holes on the wall member, and having electric terminals arranged on a surface of said circuit substrate at a side thereof opposite to the wall member, said circuit substrate being formed of an electrically insulative material sufficiently hard to keep a positional relation with said wall member;

(c) electrically conductive contact pin members slidably inserted in respective through-holes on said wall member and respective through-holes on said circuit substrate, each of said contact pin members having two ends one of which is in contact with one of said code indicia and the other of which projects from said opposite side surface of the circuit substrate; and

(d) electrically conductive spring members biasing said contact pin members toward said chamber, each of said spring members having two ends one of which is fixed to one of said electric terminals and the other of which is in contact with the other end of a corresponding contact pin member.

4,558,936

FILM ADVANCING AND PROCESSING APPARATUS

Christian C. Petersen, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 31, 1984, Ser. No. 645,836

Int. Cl.[4] G03B 17/52

U.S. Cl. 354—86 **7 Claims**

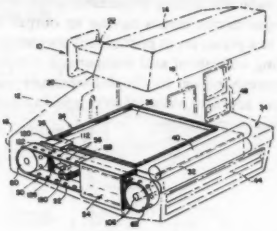
1. Apparatus for use in photographic apparatus of the type usable with a self-developing film unit having releasable processing fluid associated therewith comprising:

first means operable for initially engaging the film unit at an

exposure station following exposure and advancing the film unit therefrom;

second means operable for engaging the film unit as it is advanced from said exposure station and effecting the release and spreading of the fluid across the film unit; and,

means for driving both said first and second means;



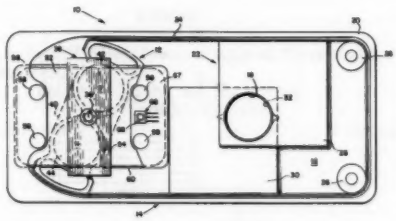
said driving means includes a timing belt assembly which is operatively connected to said first means, and said second means and a stepping electromagnetic actuator which is coupled to said timing belt assembly for incrementally steppng said timing belt to thereby facilitate incremental driving of said first and second means.

4,558,937

ELECTROMAGNETIC BLADE MECHANISM

Christian C. Petersen, Westwood, Mass., and Ken G. Wasson, Los Gatos, Calif., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 6, 1984, Ser. No. 577,562
Int. Cl.[4] G03B *9/40*
U.S. Cl. 354—234.1 **14 Claims**



1. An electromagnetic actuator comprising:

a movable assembly;

means including a supporting base assembly for supporting said movable assembly for movement along a given path;

a permanent magnetic arrangement coupled to one of said movable assembly or supporting assembly and having at least a field with the flux thereof extending to the other on of said movable assembly or supporting assembly;

conducting means operatively coupled to the other one of said movable assembly or supporting assembly and being positioned in the flux for effecting movement of said movable assembly in response to being energized; and,

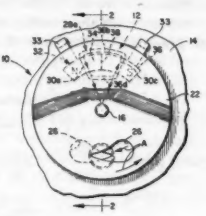
means for generating attractive magnetic forces acting on said movable assembly for offsetting other predetermined magnetic forces acting on said movable assembly which would otherwise have a tendency to cause said movable assembly to deviate from said given path.

4,558,938

TWIN ROTATABLE ELECTROMAGNETICALLY DRIVEN BLADE MECHANISM

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,309
Int. Cl.[4] G03B *9/12*
U.S. Cl. 354—234.1 **12 Claims**



1. An electromagnetically actuated blade mechanism of the type usable in a photographic apparatus for controlling radiation along a given path comprising:

a pair of juxtaposed armature blade assemblies, each of said armature blades being mounted for rotation, each of said armature blades having at least portions thereof in opposing spaced-apart relationship to each other so as to define a space therebetween, each of said armature blades includes an aperture wherein said apertures are movable between unblocking and blocking conditions in response to counter-rotation of said armature blades with respect to one another;

conducting means coupled to each of said armature blades for movement therewith, each of said conducting means including a coil which is generally planar and parallel to said blade and has active conducting portions which are selectively energizeable; and,

a permanent magnetic arrangement fixedly situated in said space intermediate said blade assemblies, said permanent magnetic arrangement including means for producing at least a pair of magnetic fields each one of which faces away from the other and extends to corresponding active conducting portions on respective ones of said armature blades, said fields having respective polarities, such that when said active conducting portions are energized said armature blades counter-rotate with respect to each other, whereby said apertures move between said unblocking and blocking conditions for controlling radiation along the path.

4,558,939

FLASH PHOTOGRAPHY SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Masaaki Nakai, Nara; Takanobu Omaki, Sennan; Hiroshi Hosomizu, Nara; Masatake Niwa, Sakai; Toru Inoue, Toyonaka, and Minoru Sekida, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1983, Ser. No. 544,870
Claims priority, application Japan, Oct. 22, 1982, 57-186640; Oct. 29, 1982, 57-190996; Dec. 14, 1982, 57-219565
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—416 **7 Claims**

1. A flash device comprising:

(a) input means for receiving a flash light start signal from a photographic camera;

(b) means for effecting emission of flash light from the flash device in response to said flash light start signal received by said input means;

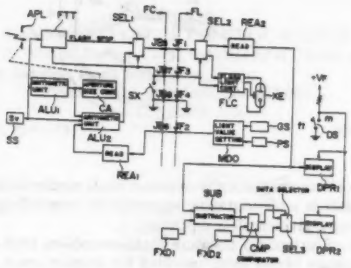
(c) means for stopping emission of the flash light by a flash light stopping signal from the photographic camera

(d) means for receiving an aperture control value a film

speed value from the photographic camera for flash light photographing in series in a digitalized bit-by-bit manner in synchronism with a clock pulse train fed from the photographic camera;

(e) maximum light quantity output means for producing a signal representing a maximum light quantity which can be emitted from the flash device;

(f) calculating means for calculating a maximum photographing distance covered by the flash light for effecting a correct exposure on the photographic object for flash light photographing on the basis of said aperture control



value, said film speed value and said maximum light quantity;

(g) means for introducing said clock pulse train from the photographic camera;

(h) means for manually selecting between a first unit of distance and a second unit of distance; and

(i) display means for displaying the maximum photographing distance from the output of the calculating means in accordance with a selected unit of distance, said displaying means including common displaying elements usable both in said first and second units of distance.

4,558,940

MANUAL APERTURE VALUE SETTING CIRCUIT FOR CAMERA

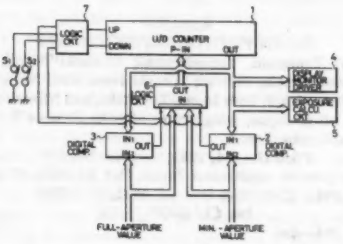
Eiichi Tano; Takeo Kobayashi, and Kiyoshi Negishi, all of Tokyo, Japan, assignors to Asaki Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,315

Claims priority, application Japan, Nov. 29, 1983, 58-224700

Int. Cl.[4] G03B *7/095*

U.S. Cl. 354—455 **4 Claims**



1. A manual aperture value setting circuit for a camera, comprising:

manual aperture value setting switches;

a presettable counter which counts up and down in response to operation signals provided by said switches;

comparison circuit means for comparing an output of said presettable counter with digital data corresponding to a full-aperture value and a minimum aperture value of a lens mounted on said camera;

first logic circuit means connected between said switches and input terminals of said presettable counter for subjecting outputs of said comparison circuits and operation signals of said switches to first predetermined logical operations to control transmission of said operation signals of said switches to said presettable counter; and

second logic circuit means having an output terminal connected to a preset input port of said presettable counter for subjecting outputs of said comparison circuits and digital data corresponding to the full-aperture value and the minimum aperture value of said lens to second predetermined logic operations.

4,558,941

DEVELOPING APPARATUS

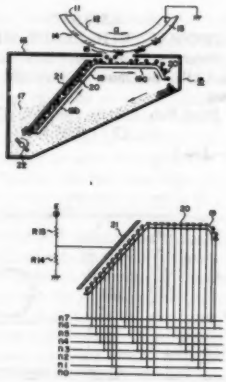
Takefumi Nosaki, Toshiba-Isogo-Dairoku-Ryo, 2-8-2, Shiomidai, Isogo-ku, Yokohama-shi; Koji Tanimoto, Toshiba-Shinkoyasu-Daiichi-Ryo, 2-14-10, Shinkoyasu, Kanagawa-ku, Yokohama-shi, and Masahiro Hosoya, Toshiba-Kikuna-Ryo, 217 Mamedo-cho, Kohoku-ku, Yokohama-shi, all of Japan

Filed Mar. 29, 1984, Ser. No. 594,532

Claims priority, application Japan, Mar. 31, 1983, 58-55979; Mar. 31, 1983, 58-56009; Mar. 31, 1983, 58-56049

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—3 DD **16 Claims**



1. A developing apparatus comprising:

developing medium carrying electrode means having a number of strip electrodes which are consecutively arranged at predetermined intervals and which are divided into a first section and a second section, said first section being located near a surface of a photoconductive member on which an electrostatic latent image is formed, said second section being provided with one end portion for receiving a developer medium;

first potential applying means for applying to said strip electrodes potentials which have a predetermined distribution and change as a time function, so that electric fields, shifting from said second section to said first section, are applied to said strip electrodes;

opposed electrode means disposed to oppose said second section; and

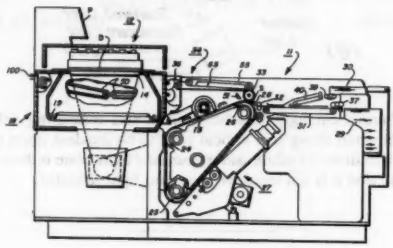
second potential applying means for applying a predetermined voltage to said opposed electrode means.

4,558,942

VERY HIGH SPEED DUPLICATOR WITH FINISHING FUNCTION FOR DUPLEX COPYING DOING IMMEDIATE INVERSION OF COPY SHEETS

Bernard A. Chiama, Penn Yan, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,585
Int. Cl.[4] G03G *15/00*; B65H *39/10*
U.S. Cl. 355—14 SH **9 Claims**



1. A reproduction system comprising:

a document handling apparatus adapted to transport individual document sheets from a supply stack to an exposure platen and effecting two exposures of each side of each document sheet and returning the same to the stack,

a copy sheet processor having means for producing the information on each side of each document sheet onto one side of two side-by-side copy sheets, and to invert the two copy sheets immediately and produce the information on the other side of the document sheet onto the other side of the copy sheets,

collating means arranged to receive the copy sheets from the processor and to collate the same into two copy sets alternately, each set being a reproduction of the document sheets in the document stack, and

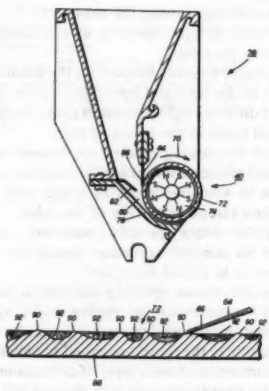
a finishing apparatus adapted to receive said copy sets alternately and to bind the sets.

4,558,943

DEVELOPER ROLLER

Herbert S. Patz, Wayland, Mass., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1983, Ser. No. 549,094
Int. Cl.[4] G03G *15/08, 15/09*
U.S. Cl. 355—3 DD **26 Claims**



14. An electrophotographic printing machine of the type having a photoconductive member arranged to have a latent image recorded thereon, wherein the improvement includes:

a housing defining a chamber for storing a supply of marking particles therein;

means for transporting the marking particles from the chamber in said housing to a development zone closely adjacent to the latent image recorded on the photoconductive member, said transporting means comprising a support member having the exterior surface thereof roughened forming a multiplicity of peaks extending outwardly therefrom with a coating of polymeric material filling the space between adjacent peaks so that at least a portion of the peaks of the support member extend beyond the coating of polymeric material thereon; and

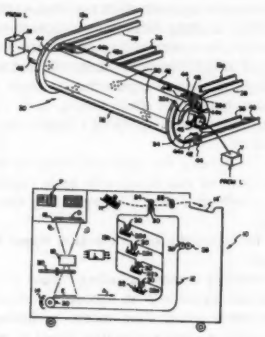
means for controlling the thickness of the layer of marking particles on said transporting means, said controlling means having a free edge contacting the peaks of the support member of said transporting means and being spaced from the polymeric material coated thereon.

4,558,944

APPARATUS FOR ESTABLISHING A PREDETERMINED INTERFACE BETWEEN A DIELECTRIC SHEET AND AN ELECTROGRAPHIC PROCESS STATION

Carl R. Bothner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1984, Ser. No. 635,040
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—3 SH **7 Claims**



1. In an electrographic copier having a plurality of electrographic process stations for forming visible images on the surface of discrete dielectric sheets, apparatus for establishing a predetermined operative interface between a discrete dielectric sheet and an electrographic process station so that the function of such process station is uniformly applied to the surface of such dielectric sheet, said apparatus comprising:

means for selectively supporting a discrete dielectric sheet a predetermined distance from a process station, said supporting means including a member having a sheet supporting surface mounted for movement along a path from a location remote from such process station to a location a predetermined distance from such process station and then away from such process station;

means for moving the supporting surface of said member along such path;

means associated with said member for clamping an edge of a discrete dielectric sheet to said member; and

means for tacking successive portions of the surface area of said discrete dielectric sheet, measured from such clamped edge, to said supporting surface of said member as such portions are moved with said supporting surface to such location a predetermined distance from such process sta-

tion, whereby the function of said process station is uniformly applied to the surface of such sheet.

4,558,945

REPRODUCTION CAMERA WITH SYSTEM TO CORRECT EXPOSURE FOR STRAY LIGHT

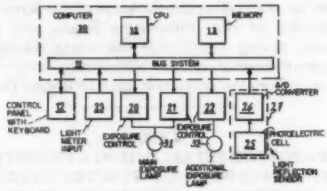
Steen Andersen, Allerod, Denmark, assignor to Helioprint AS, Kvistgaard, Denmark

Filed May 25, 1984, Ser. No. 614,451

Claims priority, application Netherlands, May 26, 1983, 8301858

Int. Cl.⁴ G03B *27/78*

U.S. Cl. 355—68 **6 Claims**



1. In a reproduction camera for the production of contact screen prints from originals, including means for holding a contact screen and a light-sensitive material, means for holding in imageable relation to said material an original to be reproduced, an optical system for projecting a light image of the original onto the light-sensitive material, exposing means operable to effect an imagewise main exposure of said material to light through the screen and a non-imagewise additional exposure thereof to light through the screen, and means for controlling the light dosage of exposures;

computer means for determining and, via said exposure controlling means, applying a light dosage suited for each exposure;

means for sensing the light reflected by the original under conditions of said imagewise main exposure and producing a reflection signal representing the amount of such light;

means for inputting said reflection signal to said computer means;

said computer means including means for converting said reflection signal into an exposure correcting signal; and

said exposure controlling means including control means responsive to said correcting signal to influence the light dosage in said non-imagewise additional exposure through the screen, thereby taking into account the effect of stray light reflected by the original during an imagewise main exposure.

4,558,946

AUTOMATIC ANALYZING APPARATUS

Kevin Galle, New City, N.Y.; Ryoichi Orimo, Ohmo, Japan; Masahiko Sakurada, Machida, Japan; Taiichi Banno, Hachioji, Japan, and Sugio Manabe, Kodaira, Japan, assignors to Olympus Optical Co. Ltd., Japan

Division of Ser. No. 139,469, Apr. 11, 1980, abandoned. This application Jan. 25, 1983, Ser. No. 460,913

Claims priority, application Japan, Apr. 14, 1979, 54-44912

Int. Cl.⁴ G01N *21/01, 21/51, 21/64*

U.S. Cl. 356—73 **4 Claims**

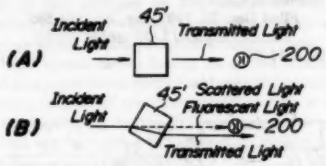
1. An apparatus for optically measuring properties of a test liquid comprising:

means including a transparent measuring cell for containing a test liquid;

means comprising a single light source for projecting a measuring light beam upon said measuring cell along an optical path;

means comprising a single light detector arranged to receive a transmitted light beam emanating from said measuring cell along said optical path; and

means for rotating said measuring cell about an axis perpendicular to said optical path such that scattered and/or



fluorescent light emanating from said measuring cell is directed along said optical path to be incident upon said light detector while said transmitted light beam is diverted so that it is not incident upon said light detector.

4,558,947

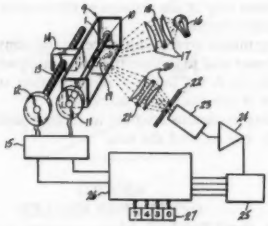
METHOD AND APPARATUS FOR MEASURING BLOOD CONSTITUENT COUNTS

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Nov. 7, 1983, Ser. No. 549,319

Int. Cl.⁴ G01N *33/48, 21/90, 15/02, 21/00*

U.S. Cl. 356—39 **23 Claims**



1. An optical scanning apparatus for measuring blood cell counts in a centrifuged sample of anticoagulated whole blood contained in a transparent tube wherein the blood cell types are separated into different layers in the tube, said apparatus comprising:

(a) means for supporting the tube;

(b) a source of light operable to illuminate the blood cell layers in the tube;

(c) photosensor means focused on the illuminated blood cell layers in the tube and operable to scan the cell layers to detect differing light intensities characteristic of the different cell types in the layers of cells;

(d) means for causing relative movement between the tube and said photosensor means for enabling said photosensor means to scan the layers of blood cells at all different locations circumferentially of the tube;

(e) converter means operably connected to said photosensor means for converting analog signals from said photosensor means to digital form; and

(f) computer means operably connected to said converter means for receiving and storing digital signals from said converter means, said computer means further being operable to utilize the signals received to calculate the average axial dimension of each layer of cells scanned to determine from previously inputted data the true cell counts for each layer of cells scanned.

4,558,948
PROCESS AND APPARATUS FOR MEASURING WAVE SURFACE DISTORTIONS INTRODUCED BY AN OPTICAL SYSTEM

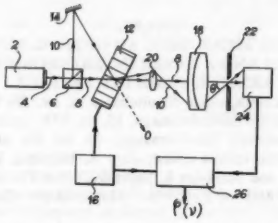
Bernard Picard, Saint Martin d'Heres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 5, 1982, Ser. No. 439,577

Claims priority, application France, Nov. 6, 1981, 81 20840; Apr. 30, 1982, 82 07499; May 3, 1982, 82 07645

Int. Cl.⁴ G01M *11/02, 11/00*

U.S. Cl. 356—124 **33 Claims**



1. An apparatus for measuring the wave surface distortions introduced by an optical system having at least one lens, said apparatus comprising:

emission means for emitting a main monochromatic and coherent light beam;

a Bragg cell for receiving at least one beam from the emission means, said cell being excited by radio-frequency waves emitted by a radio-frequency generator, so as to emit a reference beam and a measuring beam having different time frequencies;

transmitting means for supplying the reference beam and the measuring beam, emitted by the Bragg cell, to the optical system to be tested;

detection means for transforming the light signal from the optical system into a electrical signal of frequency equal to the difference of the time frequencies of the beams emitted by the Bragg cell and whose phase is characteristic of the wave surface distortions introduced by said system; and

measuring means for measuring the phase displacement between the phase of the electrical signal emitted by the detection means and the phase of an electrical signal corresponding to the radio-frequency waves used for exciting the Bragg cell.

4,558,949
HORIZONTAL POSITION DETECTING DEVICE

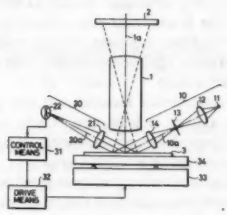
Makoto Uehara, Tokyo; Takeshi Sudo, Funabashi, and Fujio Kanatani, Yokosuka, all of Japan, assignors to Nippon Kogaku KK, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,514

Claims priority, application Japan, Dec. 26, 1981, 56-211130

Int. Cl.⁴ G01B *11/26;* **G01C** *1/00*

U.S. Cl. 356—152 **14 Claims**



1. A leveling device for maintaining the surface of an object to be inspected vertically relative to the optical axis of an image forming means comprising:

support means for supporting the object so as to be able to control the inclination of the object surface with respect to said optical axis of said image forming means;

an illuminating optical system having an optical axis obliquely arranged to the optical axis of said image forming means for supplying parallel light rays to the object surface from a direction oblique to the optical axis of said image forming means;

a condenser optical system having an optical axis arranged symmetrically with said optical axis of said illumination optical system with respect to said optical system of said image forming means for condensing the parallel light rays supplied from said illuminating optical system and reflected on said object surface, said condenser optical system including converging unit for converging the parallel light rays reflected on said object surface and a light receiving member disposed at the position where said parallel light rays are converged by said converging unit and generating signals corresponding to the position of said converged light rays; and

control means for controlling said support means based on the signals generated by said light receiving member so as to maintain the position of said converged light rays at a predetermined position on said light receiving member.

4,558,950
INTERFEROMETRIC DISTANCE AND DIRECTION MEASUREMENT

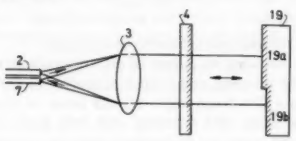
Reinhard Ulrich, Buchholz, and Klaus Jansen, Hamburg, both of Fed. Rep. of Germany, assignors to H. Maihak AG, Fed. Rep. of Germany

Filed Jul. 27, 1983, Ser. No. 517,676

Claims priority, application European Pat. Off., Jul. 28, 1982, 82.106843.4

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—345 **23 Claims**



3. An apparatus for interferometrically measuring the distance of relative linear movement between two locations and for simultaneously recognizing the direction of movement of one of the locations relative to the other comprising

a monochromatic light source;

a first partially light-transmissive reflector attached to said first location;

a second reflector attached to said second location in parallel relationship with said first reflector, said reflectors being arranged so that light from said source passes through said first reflector toward the second;

photodetector means responsive to light incident thereon to produce intensity signals proportional to the light intensity, said photodetector means being mounted to receive light emerging from said reflectors;

trigger circuit means connected to receive the output of said photodetector means for producing pulse output signals when said intensity signals cross predetermined thresholds;

at least one of said reflectors having first and second non-symmetrical regions which reflect different portions of the same light beam at times which differ from each other by a fractional wavelength, thereby changing the phase of a portion of the light relative to the remainder thereof and forming, with the other of said reflectors, a pair of merged

Fabry-Perot interferometer sets having distinguishable characteristics such that said photodetector means produces signals having a nonsymmetrical intensity characteristic with plural maxima of different heights; and

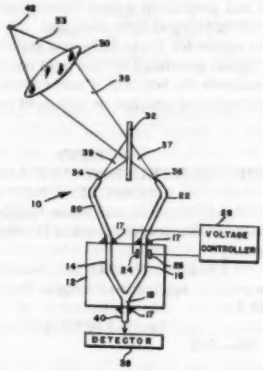
evaluating means responsive to the pulse positions from said trigger circuit means for indicating direction of movement and for counting pulses to indicate magnitude of movement.

4,558,951

FIBER FOURIER SPECTROMETER

Jacques E. Ludman, 98 Old Lowell Rd., Westford, Mass. 01731; John L. Sampson, 8 Bedford St., Lexington, Mass. 02173, and Henry J. Caulfield, 385 Old Beaverbrook, Nagog Woods, Mass. 01718

Filed Feb. 9, 1983, Ser. No. 465,229
Int. Cl.[4] G01J *3/45*
U.S. Cl. 356—346 **10 Claims**



1. A fiber Fourier spectrometer comprising:

means for receiving an output of electromagnetic radiation, amplitude dividing said output of electromagnetic radiation into a first beam and a second beam of electromagnetic radiation, and focusing said first beam to a first preselected point and said second beam to a second preselected point;

means optically aligned with said first beam and said second beam of electromagnetic radiation for receiving said first and said second beams of electromagnetic radiation and passing therethrough only a single mode from each of said beams of electromagnetic radiation;

means optically aligned with said single mode passing means for defining a first beam path and a second beam path and for combining said first and second beam paths into a single output beam path whereby said first beam of electromagnetic radiation having only a single mode follows said first beam path and said second beam of electromagnetic radiation having only a single mode follows said second beam path prior to combining into a single output beam of electromagnetic radiation following said output beam path;

means operably associated with only one of said first or said second beam paths for altering the phase of said beam of electromagnetic radiation following said one beam path prior to said first and second beams combining into said single output beam following said output beam path; and

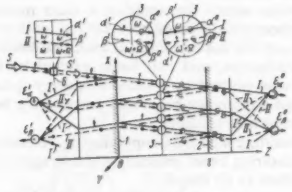
means optically aligned with said output beam path of said beam path defining means for receiving said single output beam and detecting varying intensities of said single output beam of electromagnetic radiation whereby said varying intensities can be utilized to analyze spectral components of said source of electromagnetic radiation by a Fourier spectroscopy technique.

4,558,952

METHOD FOR MEASURING AN OPTICAL LENGTH OF LIGHT PATH AND A LASER INTERFEROMETER FOR CARRYING SAME INTO EFFECT

Vladimir P. Kulesh, ulitsa Stroitelnaya, 6, kv. 29; Leonid M. Moskalik, ulitsa Molodezhnaya, 13, kv. 177; Anatoly A. Orlov, naberezhnaya Tsiolkovskogo, 22, kv. 82, all of Zhukovsky, Moskovskaya oblast; Jury A. Bliznjuk, kvartal 3a, 25, kv. 102, and Stanislav K. Shtandel, ulitsa Pervomaiskaya, 3/5, kv. 5, both of Lytkarino, Moskovskaya oblast, all of U.S.S.R.

Filed Feb. 18, 1983, Ser. No. 467,847
Int. Cl.[4] G01B *9/02, 11/02*
U.S. Cl. 356—349 **152 Claims**



7. A digital multiple-beam laser interferometer, comprising:

a laser capable of emitting a beam of coherent light;

a device for separating from said light beam two collinear light components having mutually independent polarizations, said device being positioned past said laser along the run of the light beam;

a device for offsetting the frequency of one of said light components, said device being positioned past said laser as along the run of the light beam;

a master oscillator connected to said light frequency offsetting device;

at least two reflecting elements placed one after the other as along the run of the original light beam and adapted for presetting a light path interval and forming the interfering light beams by virtue of multiple reflection of the light beam from said reflecting elements;

a birefringent plate situated between said reflecting elements and adapted for mutual conversion of the polarizations of said light components;

a polarizing element arranged on the axis of said formed interfering light beams past said reflecting elements and adapted for splitting the light of said interfering beams into two interfered light beams having said mutually independent polarizations;

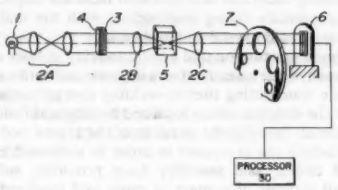
at least one photodetector located past said polarizing element on the axis of at least one of said interfered light beams and adapted for photoelectric conversion of the interfered light into an electric signal;

at least one phase measuring unit connected to the output of at least one said photodetector and adapted for measuring the phase of at least one said electric signal, from which phase the optical length of a preset light path interval is judged.

4,558,953
COLORIMETRIC METHOD AND APPARATUS

Takashi Yamada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,156
Claims priority, application Japan, Nov. 28, 1981, 56-191545
Int. Cl.[4] G01J 3/50
U.S. Cl. 356—409 8 Claims



4. A colorimeter comprising:

a light source emitting a light beam onto a cuvette;

a light receiving means for detecting the light beam transmitted through said cuvette, said cuvette positioned between said light source and said light receiving means; and

a light adjusting means arranged in an optical path between said light source and said light receiving device for selectively adjusting the amount of light transmitted through a blank cuvette to said light receiving device by adjusting said light adjusting means such that the amount of light transmitted through said blank cuvette and detected by said light receiving means approximates the amount of light which will be detected by said light receiving means when the absorbance of a reagent to be used is measured in said cuvette when said light adjusting means is set to allow the passage of the maximum amount of light to said light receiving means;

a means to measure the absorbance of said reagent while said light adjusting means allows the maximum amount of light to pass to said light receiving means;

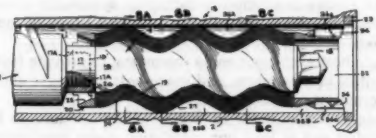
a means to measure the absorbance of a reacted sample in said cuvette while said light adjusting means allows the maximum amount of light to pass to said light receiving means; and

a means to obtain the difference between said absorbance of said reagent and said absorbance of said reacted sample to derive the absorbance value for said sample.

4,558,954
EXTRUDER SCREW AND POSITIVE DISPLACEMENT WAVE PUMP ASSEMBLY

Robert A. Barr, P.O. Box 4476, Virginia Beach, Va. 23454

Filed Dec. 12, 1984, Ser. No. 680,971
Int. Cl.[4] B29B 1/06, 1/10; F01C 19/02
U.S. Cl. 366—90 20 Claims

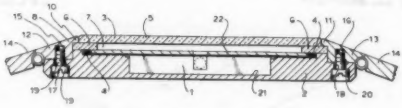


1. A screw extruder assembly for plasticating or melting solid plastic material or the like, comprising a barrel defining an elongated cylindrical bore having an upstream end and an outlet end, a screw rotatably housed in an upstream portion of said bore for rotation about a fixed axis forming the center axis of the bore and having a feed end and a discharge end, said screw having a section between the feed end and discharge end thereof comprising at least one helical thread having plural turns integral with the core of said screw, said thread originating at the feed end of said screw creating a helical channel in the space between successive turns of the thread and having a minimum clearance to the surface of the bore to feed the plastic material along the screw from the feed end to the discharge end, a positive displacement wave pump in said bore located between the discharge end of said screw and said outlet end, said pump having a stator frame provided with cylindrical outer surface portions engaging and conforming to the surface of said cylindrical bore and being supported against rotation in the bore, a rotor member having a helically contoured outer surface defining a plural turn helical thread formation of wide rounded form to orbit about the extended center axis of said extruder screw, means coupling said rotor member to the discharge end portion of said screw to be driven thereby for rotation in the stator frame, a slide disc stack of a plurality of slidable sealing discs in face to face contact with each other extending along the major portion of the axial length of the stator frame and supported thereby for reciprocative sliding movement parallel to a first diametric plane of said cylindrical bore, the slide discs forming sealing discs having opposite outwardly convex cylindrically curved surface edge portions to be moved toward confronting surface portions of said cylindrical barrel into sealing engagement therewith and be withdrawn to a range of positions spaced from said bore surface portions towards the center axis thereof by said rotor member upon rotation of the latter, the discs having shaped center apertures receiving the rotor member therethrough and accommodating movement of the full diametric range of movement of the crests of said helical thread means in a second diametric direction perpendicular to said first diametric plane, the rotor and sealing slide discs and confronting surfaces of said bore forming a series of pumping pockets between the convex outer edge portions of the sealing discs and the surface of the bore which pumping pockets are moved longitudinally through the pump to force the plastic material to move toward the discharge end of the positive displacement wave pump section and the rotor and bounding surfaces of said apertures of the discs also forming pumping pockets to force plastic material to move through said apertures toward said discharge end.

4,558,955
WRIST WATCH

Wolfgang Herchenbach, Pforzheim, Fed. Rep. of Germany, assignor to Rodi & Wienenberger AG, Pforzheim, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,573
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 8311399[U]; Nov. 22, 1983, 8333431[U]
Int. Cl.[4] G04B 37/00
U.S. Cl. 368—282 18 Claims



1. A wrist watch, comprising a lower case portion of a pot-like shape; a clockwork received in said portion; a watch glass; a seal ring positioned between the watch glass and the lower case portion said lower case portion being provided with a recess which receives said seal ring; and a watch strap having two end portions connected to said lower case portion, said watch glass being held and pressed against said lower case portion directly by said two end portions of the watch strap.

4,558,956

WATER-TIGHT WATCH

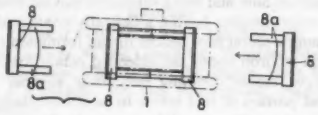
Josef Bettschen, Niederwil, Switzerland, assignor to Mondaine Watch Ltd., Switzerland

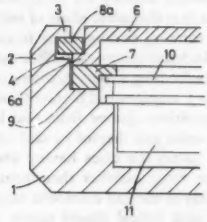
Filed Nov. 28, 1984, Ser. No. 675,843

Claims priority, application Switzerland, Dec. 20, 1983, 6771/83

Int. Cl.⁴ G04B *37/00*

U.S. Cl. 368—291 **17 Claims**





1. A water-tight watch comprising:

a case having two opposed side walls with upper flanges oriented inwardly and inner shoulders disposed below said flanges at a preselected distance to define slits, and two end walls without slits;

a watch glass with two glass edges disposed in said slits;

a packing disposed in said slits above said shoulders; and

clamping means including at least one clamping slide having two legs constructed and arranged to enter said slits as said clamping means is pushed from said walls toward a final position to press said watch glass edges against said packing.

4,558,957

PLASTIC WATCH CASING WITH PLASTIC CRYSTAL AND PROCESS FOR JOINING THE CRYSTAL TO THE CASING

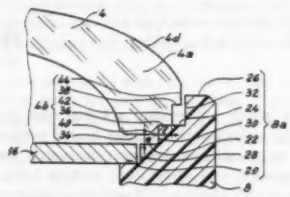
Elmar Mock, Pery, and Jacques Müller, Reconvilier, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Aug. 12, 1983, Ser. No. 522,779

Claims priority, application Switzerland, Aug. 12, 1982, 4831/82

Int. Cl.⁴ B32B *31/16*; G04B *37/00*

U.S. Cl. 368—294 **24 Claims**



1. A process of joining a crystal to a watch casing, comprising the steps of:

providing a watch casing of a thermoplastic synthetic material, said casing having an assembly face and an abutment face;

providing a crystal of a transparent synthetic material which is thermo-weldable to the material forming said casing, said crystal having a periphery provided with an assembly face and an abutment face;

providing a dial;

placing said dial and said crystal on said casing in a mutual superimposed relationship over said casing such that said assembly faces and said abutment faces are respectively at least partially facing each other, with the dial located between said crystal and said casing;

exerting a pressure on said crystal to bring at least a portion of each of the assembly faces into contact with each other while transmitting thermo-welding energy to the crystal and the casing to cause localized heating and fusion of the materials forming the portions of the crystal and the casing which are in contact in order to weld said crystal to said casing, said assembly faces providing sufficiently small surfaces of contact to cause said localized heating and fusion in the presence of said thermo-welding energy; and,

maintaining said pressure and said energy until said dial is locked between said abutment faces so as to mount said dial directly on said casing beneath said crystal.

4,558,958

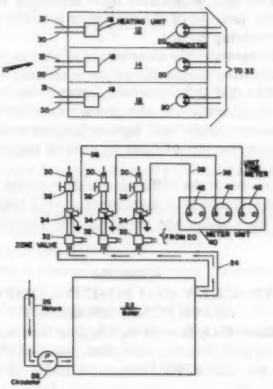
ENERGY CONSUMPTION INDICATING SYSTEM

José C. Pena, and Roland J. Pena, both of 3809 Park Ave., Union City, N.J. 07087

Filed Feb. 2, 1984, Ser. No. 576,141

Int. Cl.⁴ F24D *3/02*; G01K *17/10*

U.S. Cl. 374—39 **2 Claims**



1. An energy consumption indicating system for a multi-occupancy dwelling, including a plurality of units, which comprises:

a space heat exchanger and a thermostat to provide heating control in the system, said space heat exchanger and the thermostat provided in each unit;

a main heat exchanger having an outlet conduit, an inlet conduit and at least one circulating pump responsive to the thermostat control and in fluid flow communication with said outlet and inlet conduits;

a separate conduit member in fluid communication with said outlet conduit of said main heat exchanger and with a space heat exchanger in each unit wherein fluid flow through a conduit member of each unit is effected in response to activation of said thermostat disposed in a respective unit;

fluid flow sensing means disposed in said separate conduit

member activated by fluid flow through said separate conduit member; and

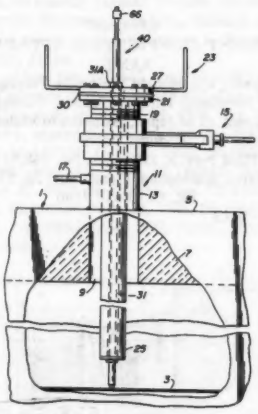
time meter means energized by said fluid flow sensing means to measure time duration of fluid flow through said separate conduit member.

4,558,959

CONTACT THERMOCOUPLE ASSEMBLY

Dean G. Thomas, Westville, and Robert J. Kopnicky, Valparaiso, both of Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 25, 1984, Ser. No. 664,669
Int. Cl.⁴ G01K *1/08, 1/14, 13/06*
U.S. Cl. 374—141 **6 Claims**



1. A thermocouple assembly for contacting the surface of a flat strip moving horizontally through a furnace, to measure the temperature of the strip comprising:

(1) entry port means in a furnace wall, for providing access to the furnace interior;

(2) an elongated, fixed thermocouple guide assembly fastened to the entry port means and extending vertically downwardly into the furnace interior;

(3) an elongated thermocouple movable within the guide assembly comprising:

(a) an elongated tubular member, having a front end and a back end, slidable within the guide assembly;

(b) an elongated insulator member slidable within the tubular member, and having a projecting end extending beyond the front end of the tubular member;

(c) a plug adapter slidable within the back end of the tubular member and contacting the insulator member;

(d) a pair of spaced-apart thermocouple wires extending through the insulator member and (i) terminating in a thermocouple junction in a contact pad at the projecting end of the insulator member and (ii) connected to the plug adapter;

(e) spring means for biasing the tubular member and insulator member in opposite directions with respect to each other; and

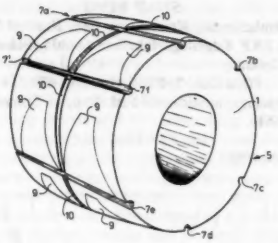
(f) the contact pad of (d)(i) being composed of a metal that has a melting point sufficiently close to the temperature range to be measured to cause a layer of molten metal to form on such contact pad from frictional heat between the moving strip and the contact pad.

4,558,960

RADIAL FRICTION BEARING ASSEMBLY

Jukka A. Lehtinen; Arvo K. Karhola, both of Helsinki, Finland, and Walter H. Griner, Lutry, Switzerland, assignors to Arcomac S.A., Yvonand, Switzerland

Filed Apr. 3, 1985, Ser. No. 719,334
Claims priority, application Switzerland, Apr. 9, 1984, 1766/84
Int. Cl.⁴ F16C *33/10*
U.S. Cl. 384—373 **15 Claims**



1. A radial friction bearing assembly comprising

a stationary, essentially cylindrical shaft member, an essentially annular sleeve member rotatably mounted on said shaft member, a gap being provided between the outer surface of said shaft member and the inner surface of said sleeve member, adapted to receive a lubricant;

said shaft member being provided, on its outer surface, with a plurality of longitudinal grooves extending parallelly to the axis of said shaft member and being equidistantially arranged around said outer surface, one end of said grooves being connected to a lubricant supply means to feed a lubricant into said gap between said shaft member and said sleeve member;

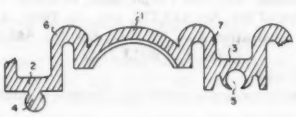
said outer surface of said shaft member further being provided with a plurality of essentially trapezoidal recesses extending substantially in circumferential direction of said shaft member, the base edge of the trapezoid of said recesses adjoining said longitudinal groove and communicating therewith in order to enable the lubricant circulating in said longitudinal groove to enter the space between said trapezoidal recess and the inner surface of said sleeve member rotating on said shaft member.

4,558,961

CAGE FOR A ROLLING BEARING

Ingemar Fernlund, Hindås, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

Filed Sep. 28, 1984, Ser. No. 655,629
Claims priority, application Sweden, Nov. 11, 1983, 8306211
Int. Cl.⁴ F16C *33/38*
U.S. Cl. 384—526 **4 Claims**



1. A cage for the rolling elements of a rolling bearing comprising a pair of complementary annular cage members made of a flexible resilient material, said cage members being interconnected and arranged on either side of the plane of the pitch circle of the rolling elements, each cage member having circumferentially spaced first portions closely conforming to the shape of said rolling elements enclosing the same and defining portions of cage pockets for the rolling elements and second

cage portions between said first portions having means for connecting the cage members and resilient third portions formed integrally with and disposed between said first and second portions, said third portions being of arcuate shape defining a flexible hinge connection permitting movement of said first portions and rolling elements relative to one another in an axial and circumferential direction of the cage.

4,558,962

SNAP RING

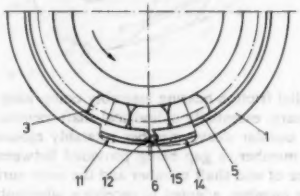
Helmut Meinlschmidt, Kronungen, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,564

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346661

Int. Cl.⁴ F16C *33/58*

U.S. Cl. 384—570 **12 Claims**



1. In a snap ring for axially holding a machine element, the snap ring having a gap extending radially there through; the improvement wherein said gap is defined by mutually facing ends of said snap ring and said snap ring is prestressed in a direction to hold said ends separated from one another, one of said ends having a circumferentially extending projection thereon and the other of said ends having a recess extending in the circumferential direction therein, said projection having first and second oblique surfaces positioned to be circumferentially movable to engage corresponding third and fourth oblique surfaces in said recess by compression of said ring, said first, second, third, and fourth oblique surfaces extending in directions to prevent radial displacement of said end having the projection formed thereon with respect to said other end having the recess formed therein when said respective first and third and said second and fourth oblique surfaces are in contact.

4,558,963

FEED RATES AND TWO-MODE EMBODIMENTS FOR THERMAL TRANSFER MEDIUM CONSERVATION

Steven L. Applegate; James J. Molloy, both of Lexington, Ky., and Clayton V. Wilbur, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 413,272, Aug. 30, 1982, abandoned. This application Aug. 10, 1984, Ser. No. 640,208

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **90 Claims**

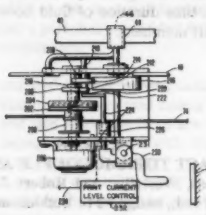
1. A transfer-medium-conserving thermal printer comprising:

a printhead for providing a pattern of heat for thermal printing of images,

means to move said printhead relative to a print-receiving location, and

means to feed a transfer medium past said printhead for printing from said transfer medium from areas heated by said printhead,

said means to move said printhead being for moving said printhead an amount which is in a ratio greater than about 5 to 1 with respect to the amount of feed by said means to feed a transfer medium to conserve a transfer medium



being fed by feeding said transfer medium in an amount significantly less than the amount of printhead movement.

4,558,964

PRINT ELEMENT AND PRINTING APPARATUS USING SAME

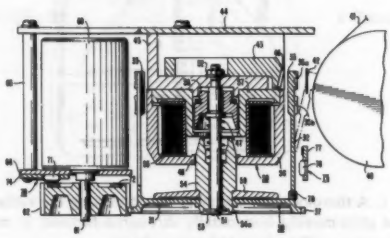
Noboru Katakabe, Uji; Shuichi Watanabe, Neyagawa; Takehisa Takamiya, Hirakata; Hiroaki Takase, Hirakata, and Orio Yoshii, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 3, 1983, Ser. No. 548,424

Claims priority, application Japan, Nov. 26, 1982, 57-207807

Int. Cl.⁴ B41J *1/46*

U.S. Cl. 400—144.1 **6 Claims**



1. A printing apparatus comprising:

a print element having;

a disc-shaped base at a base end of said print element, said base having an axis of rotation through the center thereof perpendicular to the base,

a plurality of resilient spokes extending perpendicularly from said base, said spokes being arranged in a cylinder coaxial with said axis of rotation and each having a base end attached to said base and a free end on the other end from said base end, each of said plurality of resilient spokes having two type elements on the surface thereof near the free end thereof which faces outwardly of said axis of rotation, and

a gear integral with said base and coaxial with said axis of rotation, the diameter of said gear being larger than the diameter of said cylinder;

means for rotating said print element around said axis of rotation to printing positions among a plurality of circumferential printing positions, and having a motor and a motor gear driven by said motor and engaged with said gear of said print element for rotating said print element for bringing a desired one of said plurality of resilient spokes into a printing position;

shift means connected to said print element for moving said print element along the rotational axis of said print element for bringing a desired one of the two type elements on a spoke into a printing position;

hammer means for engaging the spoke at the printing position and forcing the type element thereon against a printing medium; and

support means on which said shift means and said hammer means are supported, said support means being adjacent the end of the print element corresponding to the free ends of said spokes for supporting said shift means and said hammer means in the space within the cylinder from said end of said print element, whereby said print element can be detached from and attached to said shift means from the direction of the base end of the print element without displacing said shift means or said hammer means.

4,558,965

PRINTING APPARATUS CONTROLLING ADVANCEMENT OF PRINTING PAPER, ACTUATION OF A HAMMER, AND ADVANCEMENT OF AN INK RIBBON

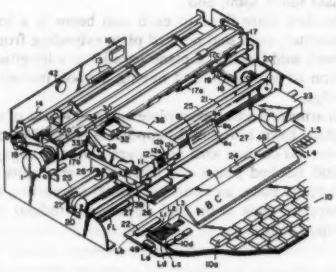
Hiroyuki Ueda, Kawasaki; Yasuaki Yamada, Matsudo; Toshiaki Ozawa, Higashi; Hiroharu Nakajima, Kodaira, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 523,442, Aug. 15, 1983, abandoned, which is a division of Ser. No. 314,441, Oct. 23, 1981, abandoned. This application Jan. 29, 1985, Ser. No. 695,760

Claims priority, application Japan, Oct. 31, 1980, 55-152103; Oct. 31, 1980, 55-152104; Oct. 31, 1980, 55-152105; Oct. 31, 1980, 55-152106; Nov. 17, 1980, 55-160692; Nov. 17, 1980, 55-160693; Nov. 17, 1980, 55-160694; Nov. 25, 1980, 55-164527; Nov. 25, 1980, 55-164530; Nov. 28, 1980, 55-166635

Int. Cl.[4] B41J *1/24, 7/92, 19/96, 33/00*

U.S. Cl. 400—144.2 **3 Claims**



1. A printing apparatus for printing on printing paper, comprising:

carriage means movable relative to a printing paper;

an ink ribbon mounted on said carriage means for advancement;

type means mounted on said carriage means for carrying a plurality of type elements;

a hammer mounted on said carriage means for striking any of said type elements carried on said type means against the printing paper;

a first pulse motor for advancing the printing paper;

a second pulse motor for advancing said ink ribbon;

means for actuating said hammer;

first pulse generating means for generating a first pulse sequence;

second pulse generating means for generating a second pulse sequence;

third pulse generating means for generating a third pulse sequence;

first selecting means for selecting one of a plurality of amounts of advancement of said printing paper;

second selecting means for selecting one of a plurality of amounts of advancement of said ink ribbon;

third selecting means for selecting one of a plurality of time intervals of actuation of said hammer;

first counting means for counting pulses from said first pulse generating means up to a first set value determined by the amount of paper advancement selected by said first selecting means;

second counting means for counting pulses from said second pulse generating means up to a second set value determined by the amount of ribbon advancement selected by said second selecting means;

third counting means for counting pulses from said third pulse generating means up to a third set value determined by the time interval of hammer actuation selected by said third selecting means;

first control means for starting advancement of said printing paper by said first pulse motor upon selection of one of the amounts of advancement of said printing paper by said first selecting means and for controlling said first pulse motor to advance said printing paper until the count by said first counting means reaches said first set value;

second control means for starting advancement of said ink ribbon by said ribbon advancing means upon selection of one of the amounts of advancement of said ink ribbon by said second selecting means and for controlling said second pulse motor to advance said ink ribbon unti the count by said second counting means reaches said second set value;

third control means for starting actuation of said hammer by said hammer actuating means upon selection of one of the time intervals of actuation of said hammer by said third selecting means and for controlling actuation of said hammer by said hammer actuating means until the count by said third counting means reaches said third set value; and

processing means for controlling operation of each of said first, second and third counting means and each of said first, second and third control means.

4,558,966

WRITING INSTRUMENT WITH SEALING CAP

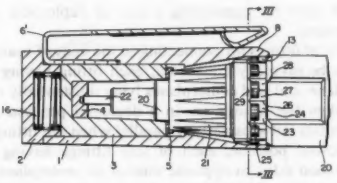
Axel Mikuteit, Hamburg, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Sep. 9, 1983, Ser. No. 530,819

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234514

Int. Cl.[4] B43K *9/00*

U.S. Cl. 401—213 **9 Claims**



1. A writing instrument having a removable closure cap sealingly closing the writing tip, said cap comprising an axially extending sheath **1** with an insertion side defined by an opening substantially circular and a radially, elastically deformable, substantially axially extending finger **8** with a free end having a protrusion proximate its insertion side, so that when the closure cap is in the mounted position the protrusion is adapted to engage an indentation surrounding the writing instrument body and proximate the writing tip end, whereupon an annular shoulder of the writing tip normally located within the closure cap will be resiliently urged in sealing engagement with a sealing shoulder of the closure cap, characterized further in that said finger **8** is defined between two closely spaced, substantially axially extending notches **7** within the sheath, and an inner face of the finger (**8**), which is oriented toward said

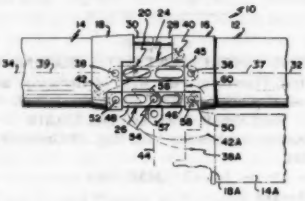
indentation when the closure cap (1, 2, 3, 4, 5) is in the mounted position, comprises a pair of planar cam faces (13), said cam faces being located normally substantially in intersecting chord planes of the circle defining the closure cap opening, which cam faces, upon a rotation of the mounted closure cap, being adapted to be brought into and out of engagement with at least one correspondingly-shaped wedge faces (27) on the writing tip body (20) as a result of the further face that at least a second group of at least two intersecting chord plane cam faces are defined within an inner face of said sheath at the same axial location as said cam faces 13, and a relative rotation of the sheath and instrument body causes said second group to be brought into and out of engagement with at least one other of correspondingly shaped wedge faces (27), whereby said second engagement radially deforms said finger 8 and releases said protrusion from said indentation, while displacing the longitudinal axes of said closure cap and said writing instrument.

4,558,967

JOINT FOR DEPLOYABLE STRUCTURES

Norwood D. Craighead, II, Sunnyvale; Richard J. Preliasco, and Timothy D. Hult, both of Mountain View, all of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 25, 1983, Ser. No. 469,864
Int. Cl.⁴ F16C *11/00*
U.S. Cl. 403—113 **9 Claims**



1. A joint for connecting a pair of deployable structures comprising:

a pair of fittings for connecting to the ends of beams that are to be pivotally connected, each fitting having a centerplane, and said centerplanes lying substantially coincident when the fittings are in a deployed position and lying spaced but substantially parallel when the fittings are in a stowed position, each of said fittings having first and second sides on opposite sides of its centerplane, and said first sides of both fittings lying on the same side of both centerplanes when the fittings are in said deployed position;

a center link having opposite ends pivotally connected to first and second of said fittings at axes that each lie substantially on the centerplane of the corresponding fitting; and

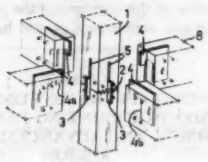
a toggle assembly which included first and second toggle bars that each have an inner end pivotally mounted about an inner axis on a different one of said fittings and an outer end pivotally connected about an outer axis to the outer end of the other bar, the inner pivot axes of said bars both lying on the first sides of said centerplanes, said bars constructed so when the fittings are deployed, imaginary lines connecting the two pivot axes of each bar are angled by less than 10° from alignment.

4,558,968

BEAM CONNECTOR

Gerhard Meickl, Ockenfels, Fed. Rep. of Germany, assignor to Streif AG, Rhein, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,418
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046790
Int. Cl.⁴ F16B *9/00*
U.S. Cl. 403—174 **1 Claim**



1. A connection of a plurality of horizontal beams with a vertical wooden pillar, said connection comprising:

a glued tenon joint at a first position along a longitudinal direction of said pillar and having upper and lower longitudinal sides;

crossed slots in said pillar and extending along said first direction, said slots extending on both said upper and lower longitudinal sides of said tenon joint;

a cross shaped rigid one piece support plate fitted in said slots and extending on both said upper and lower longitudinal sides of said tenon joint, said support plate having planar arms, means securing said support plate to said pillar on both said upper and lower longitudinal sides of said tenon joint; and

a hooked plate fixed to each said beam in a torsion-proof manner, each said hooked plate extending from an end of each said beam in a plane parallel to a longitudinal direction of said beam and having a hook including a lower edge,

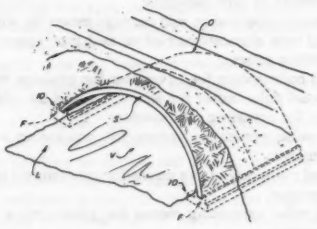
said arms of said support plate and said hooks of said hooked plate have horizontal supporting areas and at least one vertical contact area which are mutually engagable when said hooked plates are inserted in said slots above said support plate, and said horizontal supporting area of said support plate is on said upper longitudinal side of said tenon joint.

4,558,969

HINGE FOR USE WITH LARGE PRE-CAST OVERFILLED LOAD SUPPORT STRUCTURES

Louis N. FitzSimons, Kensington, Md., assignor to Bebo of America, Kensington, Md.

Filed Mar. 19, 1984, Ser. No. 590,804
Int. Cl.⁴ E01F *5/00*
U.S. Cl. 405—124 **11 Claims**



1. A hinge for use with large pre-cast overfilled load support structures such as are used in highway construction or the like for associating an element of the structure with a foundation,

wherein the element includes a bottom end intersecting an inner surface of the element to form an inner edge and intersecting an outer surface of the element to form an outer edge, comprising:

a first means for bearing vertically directed forces on the foundation;

a second means for bearing horizontally directed forces on the foundation;

rotational axis forming means for permitting essentially unrestrained rotation of the element, said rotational axis forming means consisting entirely of one of the element edges bearing on said first means; and

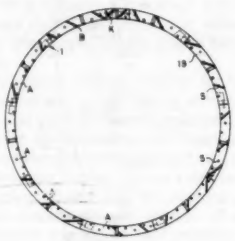
restraining means for restraining translation of the element tending to increase the span, said restraining means including the outer edge of element bearing against said second means.

4,558,970

TUNNEL SHIELD STRUCTURE

Junichi Tsuzuki, 6-30-8, Seijo, Setagaya-ku, Tokyo 157, Japan

Filed Aug. 4, 1983, Ser. No. 520,329
Claims priority, application Japan, Aug. 6, 1982, 57-136889
Int. Cl.⁴ E21D *11/00*; E04C *1/10*; F16B *7/00*
U.S. Cl. 405—153 **3 Claims**



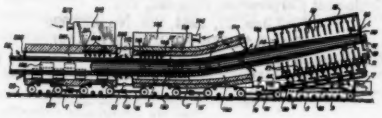
1. A tunnel shield structure having an axis and comprising a plurality of axially adjacent coaxial rings each comprised of a plurality of arcuate segments of reinforced concrete having circumferentially opposite ends and axially opposite sides, circumferentially adjacent ones of said segments of each ring having circumferentially abutting ends and axially adjacent ones of said segments of said rings having axially abutting sides, first joints between said circumferentially abutting ends each comprising at least one connecting fitting embedded in the segment providing one of said abutting ends and means interengaged with the segments providing the other of said abutting ends and with said connecting fitting to circumferentially hold said circumferentially adjacent segments together, and second joints between said axially abutting sides each comprising axially aligned bolt holes extending through said axially adjacent segments, a conical recess in each of said abutting sides of said segments, said recesses being axially aligned with said bolt holes and diverging in the direction toward the corresponding one of said abutting sides, a guide ring having axially oposite ends each received in and tapered to engage a corresponding one of said conical recesses to hold said axially adjacent rings against relative displacement laterally of said axis, elongated bolts extending through said bolt holes and guide ring and having threaded ends in said conical recesses, and a coupler in said recesses and internally threaded to receive said threaded ends of said bolts to axially hold said axially adjacent rings together.

4,558,971

CONTINUOUS PIPELINE FABRICATION METHOD

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Mar. 6, 1984, Ser. No. 586,831
Int. Cl.⁴ F16L *1/04*
U.S. Cl. 405—158 **31 Claims**



1. The method of forming a continuous, jointless and uninterrupted reinforced plastic pipe comprising the steps of:

forming a continuous articulated mandrel;

supporting the mandrel at a plurality of mobile stations;

advancing the stations to carry the mandrel along forwardly at a predetermined speed;

winding strands of a material preimpregnated with a resin about a forward end of the mandrel at a forward one of the stations;

moving an external surface of the mandrel rearwardly as the strands are being wound to carry a pipe structure formed thereby rearwardly without any relative sliding motion between the external surfaces of the mandrel and of the strands;

curing the resin in the pipe structure at an intermediate one of the mobile stations located behind the forward station;

cooling the pipe at a rearward one of the stations located behind the intermediate mobile station; and

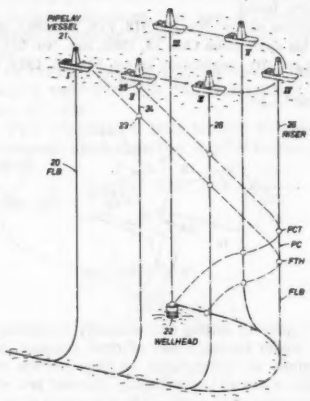
extracting the external surface of the mandrel continuously from inside the pipe at a rearward end of the mandrel without any relative sliding motion between the external surface and the pipe.

4,558,972

SUBSEA PIPELINE CONNECTION

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1983, Ser. No. 499,013
Int. Cl.⁴ F16L *1/04*; E21B *43/01*
U.S. Cl. 405—169 **9 Claims**



1. A method for laying a flowline to a subsea structure comprising:

laying the flowline to the vicinity of the subsea structure by a circuitous path to form a slack loop in the flowline; and

drawing the flowline the remaining distance to the subsea

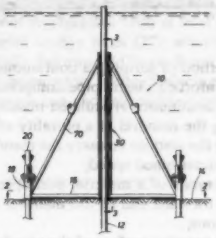
structure by forces exerted axially at a point near the end of the flowline.

4,558,973

SUBSEA WELLHEAD PROTECTOR

Joseph W. Blandford, Houston, Tex., assignor to Seahorse Equipment Corporation, Houston, Tex.

Filed Jun. 21, 1984, Ser. No. 622,990
Int. Cl.[4] E02B *17/02*; E02D *31/00*
U.S. Cl. 405—216 **11 Claims**



1. A protective subsea apparatus to be installed on an offshore well having an upstanding conductor pipe extending above the sea bottom, the apparatus comprising:

(a) an upstanding conductor clamp adapted to encircle the conductor pipe, said conductor clamp formed by two upstanding facing members supported by a bottom engaging frame;

(b) said frame including a plurality of frame members joined together defining a substantially horizontal rectangular support frame for engaging the sea bottom;

(c) a plurality of angularly extending brace members secured at one end to said conductor clamp and at the other end to said frame; and

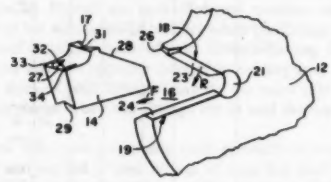
(d) said conductor clamp being fixidly attached to said frame and extending upright thereabove to enable said clamp to fasten about the conductor pipe.

4,558,974

TOOL SYSTEM FOR PRECISION SLOTTING

Joseph Pano, Nahariya, Israel, assignor to Iscar Ltd., North Nahariya, Israel

Continuation of Ser. No. 350,918, Feb. 22, 1982, abandoned. This application Oct. 15, 1984, Ser. No. 661,023
Claims priority, application Israel, Mar. 3, 1981, 62278
Int. Cl.[4] B23P *15/34*
U.S. Cl. 407—50 **10 Claims**



1. An improved cutting tool assembly comprising:

a tool holder having a pair of rigid gripping jaws formed integrally as one piece in an edge portion of said tool holder; a pair of longitudinally directed jaw edges which are directed to an acute angle of between 6° to 12° to each other and which define between them an open-ended, wedge-shaped recess of said holder which opens out towards the edge of the tool holder; a unitary cutting insert having a pair of longitudinally directed insert edges which are directed at an acute angle of between 60° to 12° to each other and which define between them a wedge shaped body portion of said insert; a leading end of said insert formed adjacent a wider end of said body portion and having formed thereon a cutting edge; an opposite rear end of said insert formed adjacent a narrower end of said body portion; wherein the improvement comprises:

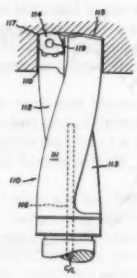
an abutment shoulder formed on an adjacent to one end of said insert edges; said insert being insertable into said recess and being frictionally retainable between said jaws with with said abutment shoulder abutting the exposed end of one of said jaws so as to limit the extent of insertion of said insert into said recess, said rear end of said insert being fully spaced from a narrow end of said recess, and chip shaping means formed on said cutting insert for controlling the shape and rigidity of the chips being formed during an operation of the assembly.

4,558,975

DRILL WITH DISPOSABLE INSERTS

Alan A. Hale, Berkhamsted, England, assignor to General Electric Company, Detroit, Mich.

Filed Sep. 27, 1982, Ser. No. 423,500
Claims priority, application United Kingdom, Feb. 26, 1982, 8205689
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.
Int. Cl.[4] B23B *51/00*
U.S. Cl. 408—186 **5 Claims**



1. A drilling tool having a shank and plurality of cutting inserts capable of forming a hole during drilling, the inserts having two parallel octagonal asymmetrical side faces and contiguous edge faces of equal length, the octagonal side faces having alternate equal obtuse angles and cutting edges formed at the junction of at least one of the side faces and each of the edge faces, the inserts being positioned along an axis perpendicular to the turning axis of the drill, at least one insert being either side of the turning axis and arranged such that they each have a different radial displacement from the turning axis of the drill, the inner insert having a cutting path which overlaps the turning axis of the drill and each next radially outer insert having a cutting path which overlaps the cutting path of the next inner insert, the cutting path of each insert being formed by the cutting edges either side of one of the equal obtuse angles of the insert, and the outermost insert having a cutting corner which extends beyond the shank of the drill such that the shank of the drill clears the hole during drilling, the cutting corner also having an obtuse angle.

4,558,976

QUICK FIX DRILL WRENCH

John H. Beglutti, Rte. 4, Box 352A, New Tazewell, Tenn. 37825

Filed Feb. 6, 1984, Ser. No. 577,213
Int. Cl.[4] E21B *15/00, 17/00*
U.S. Cl. 408—226 **10 Claims**

1. Drill wrench apparatus for use with a bit member, drilling

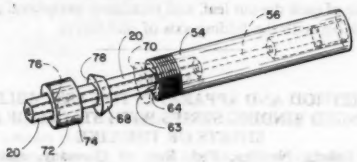
steel, and a drive source for drilling a hole in the ceiling of a mine for receiving ceiling bolts, said drill wrench apparatus comprising:

an elongated body portion having a first end, a central portion, and a further end,

said first end defining a first selected noncircular aperture for receiving with a sliding fit the shaft of a drill bit,

said central portion joining said first end to said further end, said central portion defining an aperture extending axially therethrough, said axial aperture being in register with said first selected noncircular aperture of said first end, and

said further end having a cylindrical shape and defining a second selected noncircular aperture for receiving as a sliding fit an end of a drill steel, said second selected aperture extending along the axial center of said cylindrical shape of said further end and in register with said axial aperture of said central portion, and said further



end further defining a concaved area axially centered with said cylindrical shape and wherein the outside surface of said cylindrically shaped further end includes threads;

an annularly shaped resilient member for being received in said concaved area snugly fitting around a drill steel inserted in said second selected noncircular aperture; and

a binding ring for encircling said inserted drill steel and having a surface for bearing against said resilient member, said binding ring further having a size and threads on the inside surface of said ring for meshing and cooperating with said threads on said outside of said cylindrically shaped further end so that said resilient member may be forced into said concaved area by said bearing surface when said binding ring is threaded onto said threaded further end such that said drill steel is tightly grasped by said resilient member and retained in said second noncircular aperture.

4,558,977

NC METHOD AND SYSTEM FOR MACHINING A 3D CONTOUR IN A WORKPIECE

Kiyoshi Inoue, Tokyo; Akihiko Shimizu, Kawasaki, and Jinzo Yabe, Yokohama, all of Japan, assignors to Inoue-Japax Research Incorporated and Japax Incorporated, both of Kanagawa, Japan

Filed Sep. 21, 1982, Ser. No. 421,042

Claims priority, application Japan, Sep. 21, 1981, 56-147919

Int. Cl.⁴ B23Q *33/00*; G05B *19/00*; G06F *15/46*

U.S. Cl. 409—80 **10 Claims**

1. A numerically controlled method of machining a desired three-dimensional contour in a workpiece, comprising the steps of:

(a) preparing an axial tool formed at its axial end with an effective machining surface which is substantially spherical about a center intersected by a axis of said tool;

(b) prescribing a series of points on said desired contour to be machined in said workpiece;

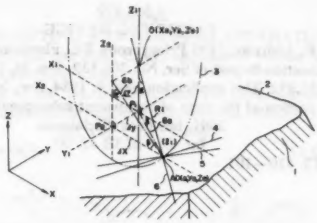
(c) identifying each of said prescribed points in terms of its coordinate values in a predetermined three-dimensional coordinate system and of angular values defining the orientation of a normal thereat to said desired contour;

(d) storing on a record medium data for said identified coordinate values and angluar values sequentially for said successive prescribed points;

(e) supporting said tool and said workpiece so that they can be translationally displaced relative to each other by drive means along the three axes of said predetermined three-dimensional coordinate system;

(f) electrically connecting said drive means with data processing means so that the former can be controlledly operated by the latter;

(g) inputting into said data processing means a numerical datum for a constant value substantially equal to the radius of a sphere at least a portion of which constitutes said effective machining surface;



(h) reproducing from said stored record medium, data for said three-dimensional coordinate values and angular values of each of said successive prescribed points on the desired contour by means of read-out means operatively connected with said data processing means;

(i) in said data processing means, computing from said reproduced data and said inputted datum, for each of said prescribed points, the three-dimensional coordinate values of the position of said center of said sphere; and

(j) producing from said computed numerical coordinate values, command signals to operate said drive means whereby said workpiece and said center in said tool are relatively displaced translationally along a path defined by a series of said positions to allow said desired contour to be progressively developed in said workpiece.

4,558,978

MACHINE FOR MACHINING CRANKSHAFTS

Hermann Berbalk, Göppingen, Fed. Rep. of Germany, assignor to Oerlikon-Boehringer GmbH, Göppingen, Fed. Rep. of Germany

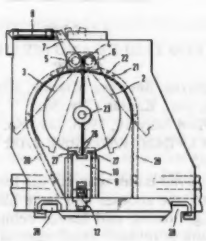
PCT No. PCT/EP83/00064, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03069, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 4, 1983, Ser. No. 557,141

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3208046

Int. Cl.⁴ B23C *3/06*

U.S. Cl. 409—200 **9 Claims**



1. A machine for machining a crankshaft, comprising: the

machining units each having a gyrocutter, and each having a clamping device for clampingly supporting a crankshaft at the same main journal when machining two crankpins of the crankshaft adjacent the main journal, each clamping device having two pivotingly mounted jaws for embracing the main journal, a gear being disposed on each jaw, the two gears being in engagement with each other, one of the two jaws being pivotable by a hydraulic cylinder, each jaw having a free end with a projection having a ramp surface, a clamping slide mounted on each clamping device and having ramp surfaces corresponding to the ramp surfaces of the jaws for locking and tightening the jaws, the jaws being arranged above the crankshaft, and the clamping slide being arranged below the crankshaft and displaceable vertically.

4,558,979

FASTENING DEVICE

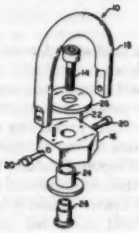
Gary E. Andrews, 5199 Priorybrook Rd., Florissant, Mo. 63033

Continuation-in-part of Ser. No. 306,139, Sep. 28, 1981, Pat. No. 4,431,352. This application Feb. 9, 1984, Ser. No. 578,772

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.[4] B23B *43/00*

U.S. Cl. 410—101 **15 Claims**



1. A fastening device for anchoring a load to a threaded base, the fastening device comprising:

(a) a stud including a head and a shank, said shank having a lower threaded portion adapted to be fastened to the base and an adjacent, upper threaded portion,

(b) a retainer member including an inner surface having a threaded portion, adapted to be received by the stud upper threaded portion, and an outer surface having a bearing portion,

(c) a bushing member including an inner surface having a bearing portion operatively engageable with the outer bearing portion of the retainer member and an end bearing portion operatively engageable with the base,

(d) interengageable means on each of said members engageable to limit relative longitudinal movement between said members, and

(e) load attaching means operatively connected to the bushing member in swivel relation for transferring applied load to the bushing member and the stud.

4,558,980

MULTI-LEAVED TABLET AND METHOD OF FORMING SAME

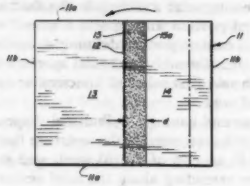
James R. Sturdivan, Shawnee Mission, Kans., assignor to Hallmark Cards, Inc., Kansas City, Mo.

Filed May 19, 1983, Ser. No. 496,026

Int. Cl.[4] B42C *9/00*; G09F *1/00*; B31D *5/00*

U.S. Cl. 412—2 **10 Claims**

1. A multi-leaved tablet wherein the leaves thereof are foldable relative to one another and have like predetermined peripheral configurations, said leaves being simultaneously die cut from a blank of foldable sheet material defining a plurality of foldably interconnected and formed panels having a predetermined peripheral configuration and arranged in contacting face-to-face relation, the contacting area of each panel surface being greater than the area of the leaf die cut therefrom, the peripheral configuration of the leaves differing from the peripheral configuration of the panels, the contacting surfaces of a pair of adjoining panels having corresponding sections



thereof interconnected by an area of adhesive, said area including an elongated substantially rectilinear peripheral segment spaced inwardly from a peripheral portion of the contacting surface of each die-cut leaf, said rectilinear peripheral segment coinciding with the folding axis of said leaves.

4,558,981

METHOD AND APPARATUS FOR ASSEMBLING PRONGED BINDING STRIPS WITH STACKS OF PAPER SHEETS OR THE LIKE

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

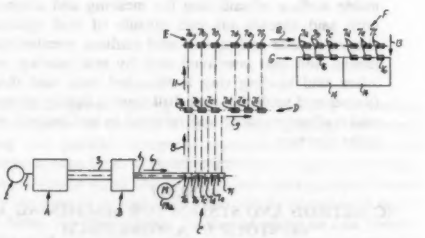
Division of Ser. No. 317,943, Nov. 4, 1981, Pat. No. 4,457,655. This application Jul. 2, 1984, Ser. No. 626,746

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042181; May 5, 1981, 3117659

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] B42C *19/00*; B21F *45/00*

U.S. Cl. 412—7 **10 Claims**

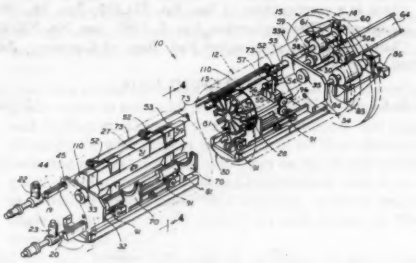


1. A method of producing blocks or analogous stationery products from stacks of perforated sheets and pronged binding strips which are obtained as a result of severing an elongated strand consisting of coherent binding strips and having a substantially C-shaped cross-sectional outline, comprising the steps of conveying the strand longitudinally and stepwise along a predetermined path; severing the leader of the strand at a severing station during the intervals of dwell of the strand so as to form a succession of discrete binding strips each having an axis; feeding stacks of perforated sheets to a binding station which is remote from the severing station; advancing successive groups of strips at right angles to their axes from the severing station toward the binding station; spreading the strips of successive groups ahead of the binding station, including moving at least one strip of each group axially; simultaneously transferring the groups with spread out strips to the binding station; and inserting the prongs of simultaneously transferred strips into the perforations of sheets at the binding station.

4,558,982
EVACUATE AND BACKFILL APPARATUS AND METHOD

David J. Oakley, Richland, and Oliver J. Groves, Seattle, both of Wash., assignors to The United States of America as represented by the Secretary of the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,325
Int. Cl.[4] B65B 31/02
U.S. Cl. 414—288 15 Claims

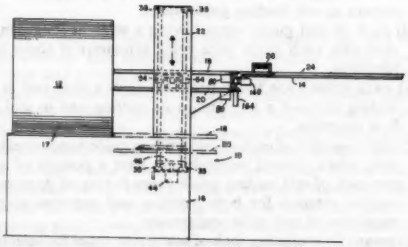


1. An apparatus for successively evacuating the purging hollow articles comprising:
an enclosure having an inlet and an outlet communicating with atmospheres containing a first and second gas, respectively;
a drum assembly rotatably mounted within said enclosure for receiving and storing a multiplicity of hollow articles;
means for feeding said articles singly from sid first gaseous atmosphere through said inlet and onto said drum assembly;
means for evacuating said enclosure to remove said first gas from said articles;
means for admitting a second gas into said enclosure for purging said articles with said second gas; and
means for discharging said purged articles singly from said drum for delivery through sid outlet into said second gaseous atmosphere.

4,558,983
AUTOMATIC BOARD HANDLING MECHANISM

Gary T. Freeman, Beverly; Richard B. Maxner, Danvers, and Thomas F. Nash, Stoneham, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Oct. 24, 1983, Ser. No. 544,734
Int. Cl.[4] B65G 1/00
U.S. Cl. 414—331 6 Claims

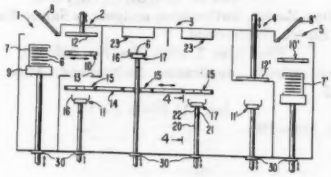


1. A mechanism for automatically loading and unloading printed circuit boards from a table of an electrical component insertion machine, comprising;
a. a support housing;
b. conveyor means mounted on an elevator carried in said housing, said conveyor means being movable vertically by said elevator to and from a position adjacent the machine table to load and unload the boards from the table;
c. a conveyor mounted on the table for receipt of the boards from the conveyor means and transfer of the boards back onto the conveyor;
d. a bridge conveyor positioned between said conveyor means and said table conveyor to transfer the boards to and from the conveyor means and said table conveyor;
e. said bridge conveyor having a drive coupling adapted to be connected to the table conveyor to drive the table conveyor to transfer the boards to and from the table; and
f. said bridge conveyor being mounted on said support housing for vertical movement into and out of driving engagement with said table conveyor.

4,558,984
WAFER LIFTING AND HOLDING APPARATUS

Charles B. Garrett, San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 611,672, May 18, 1984, abandoned.
This application Aug. 5, 1985, Ser. No. 763,079
Int. Cl.[4] C23C 13/08
U.S. Cl. 414—609 11 Claims



4. A workpiece handling apparatus, comprising:
an elevator pedestal;
an elongated lifting support member;
means for offsetting said pedestal from said lifting support member;
means for actuating said support member;
a shuttle wafer carrier having central opening and throat open to one side, with said carrier oriented so that said means for offsetting said pedestal can pass through said throat as the workpiece is raised; and
means for moving said shuttle wafer carrier.

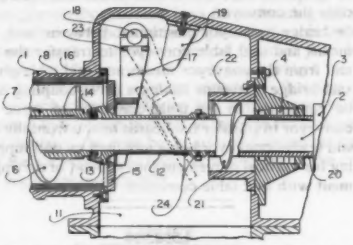
4,558,985
PUMP WITH SCREW CONVEYORS ON EACH END

Alfred Fischer, Hamburg; Claus Freimuth, Gross Hansdorf; Roland Gerlach, Hamburg, and Gerhard Siefert, Reinbek, all of Fed. Rep. of Germany, assignors to Claudius Peters AG, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,026
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224710
Int. Cl.[4] F04D 3/02; B65G 33/24
U.S. Cl. 415—74 7 Claims

1. A pump for conveying pulverized and granular material comprising:
a shaft;
screw conveyors mounted on each end of said shaft;
a housing with an inlet for the material to be conveyed and an outlet at higher gas pressure than at said inlet;
a nonreturn valve with a pivotable closing element located between said screw conveyors, said closing element having an annular shape defining a completely annular opening surrounding said shaft, the portion of said shaft upstream of said closing element being larger in diameter than the portion surrounded by the closing element, the diameter of the annular opening of said closing element being smaller than that of the diameter of the upstream

portion of said shaft but larger than said portion of said shaft which passes through said element, whereby said



closing element cooperates with the upstream portion of the shaft to form a seal with the upstream portion of the shaft.

4,558,986

CONTROL MECHANISM FOR THE STATOR VANES OF AN AXIAL TURBINE DEVICE

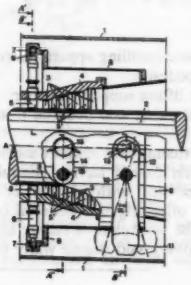
Jan Faltys, Zurich, Switzerland, assignor to Sulzer-Escher Wyss AG, Zurich, Switzerland

Filed May 7, 1984, Ser. No. 608,075

Claims priority, application Switzerland, May 31, 1983, 2972/83

Int. Cl.⁴ F04D *29/56*

U.S. Cl. 415—150 **3 Claims**



1. A control mechanism for the stator vanes of an axial turbine device having a housing, comprising:

an axial control sleeve arranged within said housing;

said axial control sleeve translating axially for controlling the stator vanes;

a control yoke for axially translating the axial control sleeve;

said control yoke having a pivot shaft pivotably journaled at the housing and arms journaled at the axial control sleeve for pivoting about a pivot axis;

said pivot shaft and said pivot axis of each one of said arms being arranged at a predetermined distance from each other;

control links, each of which are arranged essentially parallel to an associated one of said arms of the control yoke;

each of said control links having a first pivot axis in the housing and a second pivot axis in the axial control sleeve;

said first pivot axis and said second pivot axis of each of said control links having a predetermined distance substantially equal to said predetermined distance between said pivot shaft and said pivot axis of said arm; and

each of the control links forming, together with said associated arm of the control yoke, two arms of a parallelogram linkage for axially guiding the axis control sleeve during its translation in relation to the housing.

4,558,987

APPARATUS FOR REGULATING AXIAL COMPRESSORS

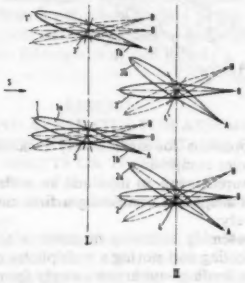
Bernhard Dittié, Moers, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 534,393, Sep. 22, 1983, abandoned, which is a continuation of Ser. No. 274,809, Jun. 18, 1981, abandoned. This application Apr. 5, 1985, Ser. No. 720,051

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025753

Int. Cl.⁴ F01D *17/16*

U.S. Cl. 415—162 **3 Claims**



1. An improved stator assembly stage for an axial compressor, comprising

(a) a first row of leading guide vanes mounted radially about a first cylindrical surface, said cylindrical surface having a center rotating axis coaxial with the longitudinal axis of said axial compressor, said leading guide vanes being uniformly, circumferentially spaced around said first cylindrical surface,

(b) a second row of trailing guide vanes mounted radially about a second cylindrical surface coaxial with said first cylindrical surface, said second row of trailing guide vanes being located successively to said first row of guide vanes in an air flow direction, said trailing guide vanes being uniformly, circumferentially spaced around said second cylindrical surface,

(c) each of said trailing guide vanes being uniformly spaced between respective pairs of leading guide vanes whereby said trailing guide vanes are uniformly staggered with respect to said leading guide vanes,

(d) each of said guide vanes having a straight longitudinal vane axis, each guide vane being symmetrical about said vane axis,

(e) each guide vane being provided with a nose end at its leading end and a rear end at its trailing end in said air flow direction,

(f) said nose ends of each of said trailing guide vanes overlapping, when viewed vertically, at least a portion of said rear ends of said leading guide vanes during all degrees of angular rotation for both positive and negative torque regulation of said axial compressor,

(g) means for mounting each of said guide vanes for selective angular rotation about a vane adjustment axis extending radially with respect to said longitudinal axis of said axial compressor and through the midpoint of said vane axis,

(h) a neutral position of each guide vane being defined as a 0° angular deviation of said vane axis from the air flow direction entering said axial compressor in a direction parallel to said longitudinal axis of said axial compressor,

(i) vane angular adjustment means associated with each of said guide vanes for rotating said guide vanes about said vane adjustment axes into selectable angular positions deviating from said neutral positions, said rotating of said guide vanes about said vane adjustment axes serving to establish an aerodynamically effective gap between each single guide vane of said first row and one of two, depending on whether positive or negative torque regulation is being established, successive, in air flow direction, adjacent guide vanes in said second row, said aerodynamically effective gap being capable of being established for both positive and negative torque of said stator assembly stage,

(j) a ring means cooperating with all of said adjustment means for simultaneous adjustment of all of said guide vanes,

(k) said ring means operating uniformly on all of said leading guide vanes to rotate all of said longitudinal vane axes of said leading guide vanes to a selected, uniform first angle of incidence with respect to the actual air flow direction,

(l) said ring means operating uniformly on all of said trailing guide vanes to rotate all of said longitudinal vane axes of said trailing guide vanes to a selected, uniform second angle of incidence with respect to said actual air flow direction, and

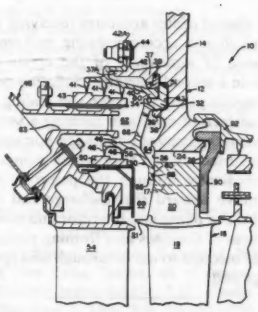
(m) the ratio of said first angle of incidence to said second angle of incidence being fixed.

4,558,988

ROTOR DISK COVER PLATE ATTACHMENT

Douglas L. Kisling, Palm Beach Gardens; Edward C. Hill, Tequesta, both of Fla., and Ronald D. Delahoussaye, Ruston, La., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,453
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—220 R **5 Claims**



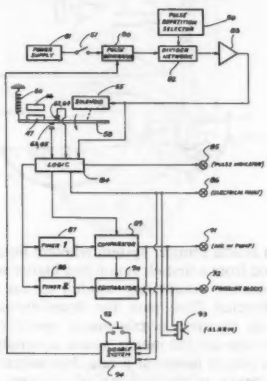
1. A device for securing a blade retaining plate to a rotor disk wherein said disk includes a forwardly facing annular groove, said groove having a forwardly facing annular bottom surface and an inwardly facing cylindrical surface and an outwardly facing cylindrical surface, said outwardly facing cylindrical surface having an outwardly facing annular groove therein spaced forwardly from said bottom surface, the inner end of said blade retaining plate having an off-set annular flange, said off-set annular flange having a forwardly facing annular face and a rearwardly facing annular face, said blade retaining plate having an outwardly facing cylindrical surface outwardly of said off-set annular flange, said outwardly facing cylindrical surface of said blade retaining plate engaging said inwardly facing cylindrical surface of said forwardly facing annular groove, said off-set annular flange having its rearwardly facing annular face positioned against the annular bottom surface of said forwardly facing annular groove, a split retainer ring being positioned in said outwardly facing annular groove and projecting outwardly thereof into the forwardly facing annular groove where it engages the forwardly facing annular face of the off-set annular flange to maintain it in said forwardly facing annular groove, a locking means being positioned between said split retainer ring and said blade retaining plate to maintain said split retainer ring in said outwardly facing annular groove.

4,558,989

FLUID PUMP

Anthony G. Chappell, Mosman, Australia, assignor to Wellcome Australia Limited, Concord, Australia

Continuation of Ser. No. 490,653, May 2, 1983, abandoned, which is a continuation of Ser. No. 144,321, Apr. 28, 1980, abandoned. This application Jul. 12, 1984, Ser. No. 630,339
Claims priority, application Australia, May 4, 1979, PD8632
Int. Cl.[4] F04B *49/02;* **A61M** *5/00*
U.S. Cl. 417—44 **6 Claims**



1. A fluid pump device for use in conjunction with a pumping chamber which is composed of an elastomeric material, which has a pair of spaced-apart unidirectional valves through which fluid can be pumped with cyclic compression and expansion of the chamber and which extends toward its full volumetric capacity following removal of a compressive force, the fluid pump device comprising:

(a) spaced-apart clamp elements between which the pumping chamber (is in use and) is removably located, one end of said pumping chamber being connectable to a source of fluid to be pumped and the other end of said pumping chamber being connected to a hypodermic-type needle by way of a fluid feed line (so that said needle establishes a firm connection for administering said fluid),

(b) means for biasing the clamp elements in a direction one toward the other, whereby the clamp elements function to compress and reduce the contained volume of the pumping chamber,

(c) electrically actuated means which when energized effect relative movement of the clamp elements in a direction one away from the other, whereby the pumping chamber is permitted to expand in a direction toward its full volumetric capacity, and when de-energized permits movement of the clamp elements toward one another under the influence of said biasing means,

(d) means for energizing the electrically actuated means at a predetermined rate whereby cyclic changes in the volumetric capacity of the pumping chamber occur with periodic energization and de-energization of the electrically actuated means, and

(e) timing means for timing the period of relative movement of the clamp elements toward one another following the de-energization of the electrically actuated means and for providing a fault condition indicating signal if the timed

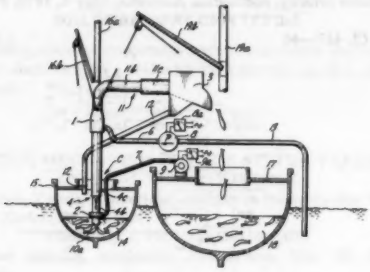
period is less than a predetermined first time interval, this being indicative of an excessively low back pressure in the pumping chamber, or is greater than a predetermined second time interval which is indicative of an excessively high back pressure in the pumping chamber.

4,558,990

COMPOSITE PUMPING SYSTEM

Stewart W. Roach, Seattle, Wash., assignor to Marco Seattle, Inc., Seattle, Wash.

Filed May 12, 1980, Ser. No. 149,139
Int. Cl.⁴ F04F *5/22*
U.S. Cl. 417—54 **15 Claims**



1. In an article transfer system wherein liquid-borne articles are pumped from a first elevation to a higher second elevation, the combination comprising conduit means defining an upwardly directed flow path for liquid-borne articles to be pumped, air injection nozzle means operatively mounted in relation to said conduit means, means to supply pressurized air to said air nozzle means at a rate that materially reduces the average density of the column of contents in said conduit means above said air nozzle means, said conduit means having an inlet at or below said air nozzle means for ingestion of liquid-borne articles to be pumped, jet pump nozzle means operatively mounted in relation to said conduit means at a relative elevation above said air nozzle means, and means to supply pressurized liquid to said jet pump nozzle means for pumping said column of contents through said conduit means.

7. The method of pumping liquid-borne articles from a first elevation to a higher second elevation utilizing a water jet pump to induce upwardly directed flow in a conduit-defined flow path, said method comprising aerating the water in said flow path as it moves upwardly from said first elevation at a location below said water jet pump to reduce the density of the water being pumped.

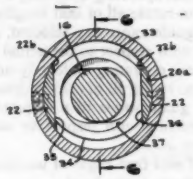
4,558,991

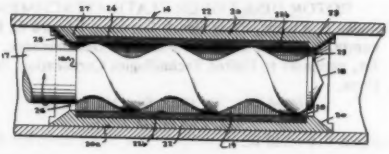
WAVE PUMP ASSEMBLY

Robert A. Barr, P.O. Box 4476, Virginia Beach, Va. 23454

Filed Jan. 10, 1985, Ser. No. 690,319
Int. Cl.⁴ F04B *23/12, 43/12;* F04C *5/00*
U.S. Cl. 417—199 R **6 Claims**

1. A wave pump assembly for pumping fluid medium comprising gaseous or liquid fluids or mixtures thereof with solids or the like, comprising a barrel defining an elongated cylindrical bore having an upstream end and an outlet end, drive shaft means journaled for rotation about the center axis of said bore, a positive displacement wave pump in said bore located between said upstream end and said outlet end, said pump having a stator frame provided with cylindrical outer surface portions engaging and conforming to the surface of said cylindrical bore and being supported against rotation in the bore, a rotor member having a helically contoured outer surface defining a plural turn helical thread formation of wide rounded form to orbit about the extended center axis of said drive shaft, means coupling said rotor member to the discharge end portion of said drive shaft to be driven thereby for rotation in the stator frame, a slide disc stack of a plurality of slidable sealing discs in face to face contact with each other extending along the major portion of the axial length of the stator frame, means supporting said discs for reciprocative sliding movement parallel to a first diametric plane of said cylindrical bore, said cylindrical bore having confronting surface portions facing the discs along the extent of said slide disc stack, the slide discs forming sealing discs having opposite outwardly convex cylindrically curved surface edge portions to be moved toward said confronting surface portions of said cylindrical bore into sealing engagement therewith and be withdrawn to a range of positions spaced from said bore surface portions towards the center axis thereof by said rotor member upon rotation of the latter, the





discs having shaped center apertures receiving the rotor member therethrough and accommodating movement of the full diametric range of movement of the crests of said helical thread means in a second diametric direction perpendicular to said first diametric plane, the rotor and sealing slide discs and confronting surface of said bore forming a series of pumping pockets between the convex outer edge portions of the sealing discs and the surface of the bore which pumping pockets are moved longitudinally through the pump to force the fluid medium to move toward the discharge end of the positive displacement wave pump and the rotor and bounding surfaces of said apertures of the discs also forming pumping pockets to force the fluid medium to move through said apertures toward said discharge end.

4,558,992

PUMP DEVICE

Isao Hamano; Akira Morishita; Yoshifumi Akae, all of Himeji; Youji Nishimura, Hyogo; Toshinori Tanaka, and Kiyoshi Yabunaka, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 548,134, Nov. 2, 1983, abandoned. This application May 1, 1985, Ser. No. 728,166
Claims priority, application Japan, Nov. 6, 1982, 57-168914
Int. Cl.⁴ F04B *35/04*
U.S. Cl. 417—250 **1 Claim**

1. A pump device, comprising:

an electric motor having an integral rotary shaft for providing a mechanical output thereof, said shaft having first and second opposite ends, extending from opposite sides of said motor;

a low pressure pump having a first fluid input and a first fluid output, directly connected to said first end of said shaft so as to be driven by rotation of said shaft;

a high pressure pump having a second fluid input and a

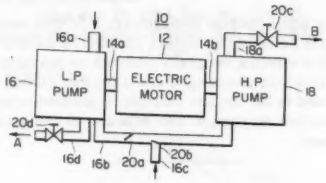
second fluid output, directly connected to said second end of said shaft so as to be driven by rotation of said shaft;

a first discharge conduit connecting said first fluid output to said second fluid input for directing fluid from said low pressure pump to said high pressure pump;

a first change-over valve in said first discharge conduit for selectively blocking fluid communication between said first fluid output and said second fluid input through said first discharge conduit;

a fluid suction conduit having a third fluid input at one end, connected at its other end to said first discharge conduit downstream of said first change-over valve and upstream of said second fluid input, for providing fluid communication therewith;

means, including a second change-over valve in said fluid suction conduit, for selectively blocking fluid communication between said third fluid input and said first discharge conduit;



a second discharge conduit connected to said second fluid output, for directing the outflow of all high or low pressure fluid from said second fluid output of said high pressure pump;

means, including a first control valve in said second discharge conduit, for selectively blocking all of the outflow of fluid from said high press pump;

a third discharge conduit directly connected to said first fluid output upstream of said first change-over valve, for discharging low pressure fluid from said low pressure pump for low pressure use; and

a second control valve in said third discharge conduit, for selectively blocking the outflow of fluid from said low pressure pump through said third discharge conduit.

4,558,993

ROTARY COMPRESSOR WITH CAPACITY MODULATION

Michimasa Hori; Hideo Hirano; Yoshinori Kojima, all of Kusatsu, and Jiro Yuda, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 3, 1984, Ser. No. 637,534

Claims priority, application Japan, Aug. 3, 1983, 58-143023; Aug. 3, 1983, 58-143024; Aug. 3, 1983, 58-143025; Aug. 3, 1983, 58-143027

Int. Cl.⁴ F04B *49/08*

U.S. Cl. 417—283 **10 Claims**

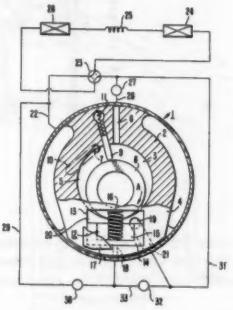
1. In a rotary compressor of the type including a cylinder block having therein a cylinder having a vertical axis, upper and lower bearing members having flanges with radially extending surfaces closing upper and lower ends of said cylinder, a suction port opening into said cylinder for introducing therein gas to be compressed, a rotor mechanism rotatable within said cylinder for compressing said gas, a discharge port extending from said cylinder for discharging therefrom the compressed gas, and means for changing the compression capacity of said compressor, the improvement wherein said means comprises:

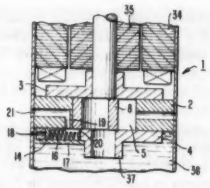
an opening formed in said flange of one of said bearing members, said opening extending from the respective said radially extending surface into said flange in a depth direction parallel to said axis, and said opening facing a portion of the respective said end of said cylinder and a portion of a respective end surface of said cylinder block;

a slide wall member mounted within said opening for sliding movement in opposite directions at right angles to said axis between a first position, whereat the slide wall member opens communication between said opening and said end portion of said cylinder, and a second position, whereat said slide wall member blocks communication between said opening and said end portion of said cylinder;

spring means mounted within said opening for biasing said slide wall member in a first said direction to said first position;

a control port extending into said opening at a location on a side of said slide wall member opposite said end portion of said cylinder; and





valve means for selectively introducing into said control port compressed gas from said discharge port, thereby sliding said slide wall member in said opening in a second said direction opposite the force of said spring means to said second position, thus blocking communication between said cylinder end portion and said opening and providing a relatively larger compression capacity of said cylinder, and for selectively interrupting introduction into said control port of compressed gas from said discharge port, whereby said spring means slides said slide wall member in said opening in said first direction to said first position, thus opening communication between said cylinder end portion and said opening and providing a relatively smaller compression capacity of said cylinder.

4,558,994

DUAL STAGE AIR COMPRESSOR

Frank J. Viola, Uniondale; Erwin L. Schaub, Manhasset; Bernard C. Sharp, White Plains, all of N.Y., and Raymond J. Evans, Stratford, Conn., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

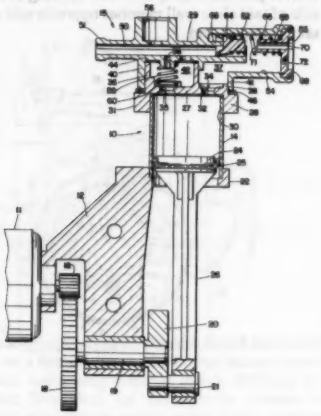
Filed Jul. 2, 1984, Ser. No. 627,328

Int. Cl.⁴ F04B *49/00*

U.S. Cl. 417—295 **8 Claims**

1. A dual stage throttled, portable air compressor, comprising:

a cylinder,
a piston reciprocal within said cylinder,
an electric motor,
means interconnecting said motor and said piston for producing reciprocal movement of said piston,
a housing in fluid communication with said cylinder,
intake and release valves in said housing for controlling air flow into and out of said cylinder upon reciprocal movement of said piston,
a throttling valve, operative when actuated to limit air flow to said intake valve, said throttling valve being actuated in response to outlet air pressure from said release valve above a predetermined level,



said housing comprising a cylinder head supported on said cylinder and a valve housing supported on said cylinder head, said intake and release valves being cooperative with intake and release valve seats respectively in said cylinder head and said throttling valve being supported in said valve housing, and
a cap forming one end of said valve housing, said cap having first and second openings therein, and a boss thereon forming a seat for said throttling valve, said first and second openings in said cap being in fluid communication with said intake valve for admitting inlet air to said cylinder, said throttling valve being operable when actuated to close said first opening to limit the flow of air to said intake valve, thereby reducing the charge of air in said cylinder.

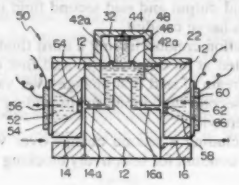
4,558,995

PUMP FOR SUPPLYING HEAD OF INK JET PRINTER WITH INK UNDER PRESSURE

Tatsuya Furukawa, Yokohama, and Masanori Horike, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,068
Claims priority, application Japan, Apr. 25, 1983, 57-71508
Int. Cl.[4] F04B *43/04*
U.S. Cl. 417—322 **4 Claims**

1. A pump for pressurizing a liquid to deliver the liquid, comprising:
a housing;
a liquid chamber formed in said housing;
a liquid suction passageway and a liquid delivery passageway which are formed in the housing;
suction valve means and delivery valve means disposed respectively in said liquid suction passageway and said liquid delivery passageway;
a diaphragm for closing the liquid chamber; and
an electrostrictive vibrator rigidly connected to the diaphragm, said electrostrictive vibrator vibrating integrally with the diaphragm perpendicularly to a plane in which the electrostrictive vibrator is connected to the diaphragm, thereby varying a volume of the liquid chamber;
said suction valve means comprising a hermatically closed suction chamber formed in a wall of the housing adjacent



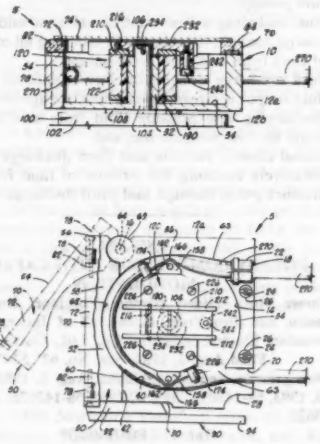
to the liquid suction passageway, a flexible suction diaphragm defining the suction chamber, a suction electrostrictive vibrator integrally mounted on the outer surface of the suction diaphragm, and a flexible suction member mounted in the suction chamber in position remote from the suction diaphragm and adjacent to the suction passageway.

4,558,996

EASY LOAD PERISTALTIC PUMP

Harold D. Becker, Oklahoma City, Okla., assignor to Organon Teknika Corporation, Oklahoma City, Okla.

Filed Jun. 30, 1983, Ser. No. 510,075
Int. Cl.[4] F04B *43/12, 45/08*
U.S. Cl. 417—374 **23 Claims**



1. A peristaltic pump, comprising:
(a) a base member;
(b) a rotor rotably disposed about an axis normal to said base member and receiving a resilient collapsible tube having inlet and outlet sections placed about said rotor;
(c) stator, comprising:
(1) a fixed stator member disposed in a permanent position relative to said rotor and said collapsible tube; and
(2) a door stator member hingedly connected to said fixed stator capable of being received by said fixed stator in tight-fitting engagement, said door stator member having hingedly connected thereto a lid member defining one side of the pump,
said stator having a concave face when the fixed stator member

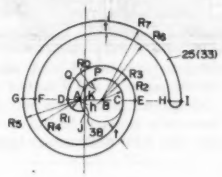
and door stator member are in tight-fitting engagement confronting the periphery of said rotor over at least an uninterrupted 180° of said periphery so as always to provide within said concave face an occludably tight engagement for said resilient collapsible tube between said stator and said rotor regardless of the orientation of the rotor, and further, whereby said door stator member and lid member may be disengaged from said rotor to facilitate removal or repair of said collapsible tube.

4,558,997

SCROLL COMPRESSOR WITH PLANAR SURFACES ON THE INTERNAL END PORTIONS OF THE SCROLL BLADES

Hirotsugu Sakata, Chigasaki, and Shigemi Nagatomo, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 29, 1983, Ser. No. 518,629
Claims priority, application Japan, Jul. 30, 1982, 57-133319
Int. Cl.⁴ F04C *18/04*
U.S. Cl. 418—55 **7 Claims**



1. A scroll compressor comprising a casing, an electric motor and a compressor unit housed in the casing, said compressor unit comprising a movable member having a first scroll blade driven eccentrically by said electric motor, a structural member having a second scroll blade encasing said movable member so that said first scroll blade revolves around a central axis of the compressor with a predetermined radius of revolution e, while the first scroll blade is maintained in sliding contact with the second scroll blade, each scroll blade having a thickness t and being formed by drawing a series of semicircles alternately around a first point and a second point spaced apart from the first point by a distance equal to a distance corresponding to the sum of said predetermined radius e and thicknesses t, and by connecting these semicircles together, and an internal end portion including a planar surface extending perpendicular to a line interconnecting said first and second points on at least one of both sides thereof, one end of said planar surface being connected with an arc formed around said first point and the other end of said planar surface being connected with an arc having a radius of curvature R equal to the predetermined radius of revolution e, said arc in turn being connected to an internal semicircle drawn around a point on said line interconnecting said first and second points.

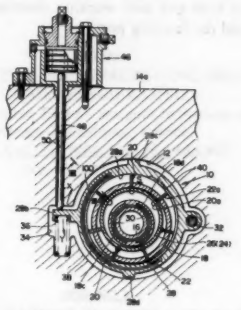
4,558,998

VARIABLE CAPACITY TYPE VANE PUMP WITH BALANCING GROOVE IN THE CAM RING

Satoshi Kiyoshige, Tokyo; Tadashi Fujikawa, Sagamihara, and Shinsuke Eguchi, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 31, 1984, Ser. No. 636,415
Claims priority, application Japan, Aug. 4, 1983, 58-142875
Int. Cl.⁴ F04C *2/00, 15/04*
U.S. Cl. 418—26 **10 Claims**

1. A vane pump comprising:
a casing having a mounting space defined therein;
an annular rotor disposed in said mounting space in a manner to be rotatable about the axis thereof relative to said casing;
a plurality of vanes carried by said annular rotor in a manner to be radially projectable from said rotor;
at least one vane ring carried by said annular rotor and carrying thereon said vanes;
a cam ring eccentrically disposed about said rotor with its cylindrical inner surface slidably contacting with the leading ends of said vanes, said cam ring having, at one inner cylindrical end portion, diametrically opposed inlet and outlet grooves which face toward the same direction;



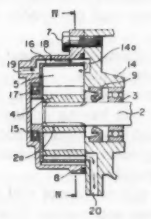
means for hermetically sealing a work chamber which is defined between said annular rotor and said cam ring, said work chamber being partitioned into several cells by said vanes;
means for defining inlet and outlet ports which are respectively connected to said inlet and outlet grooves; and
means defining in said cam ring at the position near said inlet groove a balancing groove which faces in the same direction as that of said inlet and outlet grooves, said balancing groove extending to said outlet groove to connect the same.

4,558,999

VANE TYPE PUMP DEVICE

Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,561
Claims priority, application Japan, Jun. 6, 1983, 58-87326[U]
Int. Cl.⁴ F04C *18/348*
U.S. Cl. 418—173 **6 Claims**



1. A vane type pump device comprising:
a frame,
a shaft rotatably supported by said frame,
a rotor secured to said shaft,
a plurality of vanes slidably inserted in said rotor in the radial direction,
a housing having a cylindrical inner surface whose center is offset from the axial center of said shaft,
a casing having a cylindrical inner surface with which said

vanes are slidably in contact to form working chambers, said casing being freely rotatably mounted between said cylindrical inner surface of said housing and said rotor with a center of said casing being coaxial with that of said housing, and

an intake port and a discharging port, said intake port being formed in said housing and being communicated with said discharging port through an air passage formed between said housing and said casing, through a communication hole in said frame, and through said working chambers whereby air sucked through said intake port, said communication hole and said working chambers, is discharged from said discharging port.

4,559,000

APPARATUS FOR THE PRODUCTION OF GRANULATES

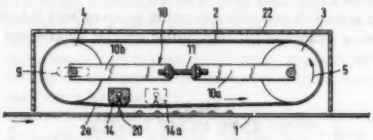
Reinhard Froeschke, Weinstadt, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jun. 19, 1984, Ser. No. 622,192

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327479; Oct. 5, 1983, 3336208

Int. Cl.⁴ A61K 9/20

U.S. Cl. 425—6 **23 Claims**



1. An apparatus for the formation of grantulates from a flowable, viscous mass, comprising:

a tubular body having a plurality of apertures which lead into a generally downwardly facing, horizontally continuous slit,

means for conducting the flowable viscous mass under pressure into said body and outwardly through said apertures and said slit,

a pair of rotatable drums spaced apart horizontally and rotatable about horizontal axes,

a belt extending around said drums to define upper and lower belt flights, said belt having orifices therein and being arranged so that said lower flight is horizontal and arranged in contacting engagement with a surface portion of said tubular body containing said slit,

means for driving at least one of said drums for moving said lower flight across said portion of said tubular body so that said orifices intermittently uncover said slit for the passage of drops of mass therethrough,

said tubular body being positioned so that said slit is located closer to the one of said drums which is upstream relative to the direction of travel of said lower flight,

a conveyor located beneath said lower flight and arranged for movement in the same direction as said lower flight, so that the drops fall onto said conveyor, and

means for moving said conveyor at the same speed as said lower flight.

4,559,001

APPARATUS FOR SEALING THE EDGES OF INSULATING GLASS PANELS

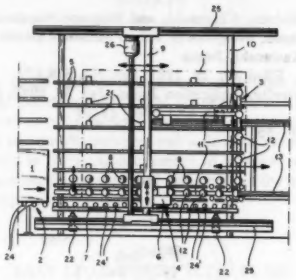
Heinrich Wiedenhöfer, Gelsenkirchen, and Tibor Szabo, Radevormwald, both of Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Furth, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,791

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310441

Int. Cl.⁴ A23G 1/20

U.S. Cl. 425—114 **3 Claims**



1. An apparatus for sealing the edges of an insulating glass workpiece having outer edges, the apparatus comprising:

upstream conveyor means including a conveyor for supporting the workpiece upright by one edge and displacing the edge-supported workpiece in a transport direction downstream from an upstream loading station to a sealing station, the upstream conveyor having a vertically displaceable portion in the sealing station;

an upright holding frame in the sealing station adjacent the vertically displaceable conveyor portion;

actuator means connected to the conveyor portion for displacing same and the workpiece supported by its lower edge thereon between upper and lower positions;

lateral holding means including a first set of suction grippers horizontally but not vertically displaceable in the sealing station into and out of engagement with the workpiece in the upper position of same to pull the workpiece tightly in position on the holding frame;

sealing means having an extruder head in the station for sealing the edges of the workpieces held by the grippers against the frame;

guide means including vertical and horizontal supports carrying the extruder head for displacing same horizontally along the horizontal edges of the workpiece and vertically along vertical edges thereof while directing the head at the edge it is traveling along;

an unloading carriage displaceable horizontally in the direction substantially without interfering with the holding frame or sealing head from the sealing station to an unloading station downstream therefrom;

a second set of suction grippers horizontally displaceable on the unloading carriage perpendicular to the transport direction; and

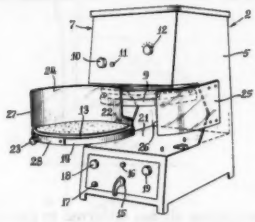
control means connected to the two sets of suction grippers for displacing the second set of the unloading carriage against and adhering same to the workpiece held therein by the first set and then releasing the first set from the workpiece.

4,559,002

PIZZA PRESS

Harold T. Atwood, Dolton, Ill.

Filed Oct. 18, 1984, Ser. No. 662,054
Int. Cl.[4] B30B *11/00*; A21C *11/00*
U.S. Cl. 425—152 **2 Claims**



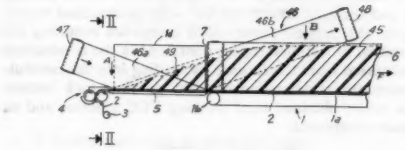
1. In a pizza press, a cabinet having a heated upper platen and an unheated lower platen, means for automatically moving said upper platen vertically within predetermined limits, said lower platen being pivoted to be manually moved in a horizontal plane into and out of vertical registration with said upper platen, and a micro switch mounted on said cabinet in the path of movement of said lower platen, said micro switch being adapted to remain open to prevent operation of said press when said micro switch is out of engagement with said lower platen and said lower platen being engageable with said micro switch to hold it in closed position when said lower platen is moved into vertical registration with said upper platen.

4,559,003

APPARATUS FOR MANUFACTURING WEBS OF POLYMER FOAM AND A PRODUCT OBTAINED

Jean Poncet, 4, rue Reine Jeanne, 13100 Aix-en-Provence, France

PCT No. PCT/FR82/00056, § 371 Date Nov. 1, 1982, § 102(e) Date Nov. 1, 1982, PCT Pub. No. WO82/03357, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 23, 1982, Ser. No. 441,514
Claims priority, application France, Mar. 24, 1981, 81 06043
Int. Cl.[4] B29D *27/04*
U.S. Cl. 425—224 **16 Claims**



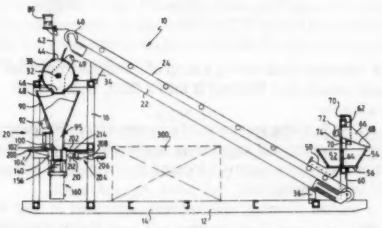
1. Apparatus for producing webs of polymer foam obtained from a mixture of liquid reagents generating an expanded foam and comprising a container, means for continuously introducing into said container said mixture of liquid reagents and a U-conveyor having a movable and continuously travelling surface on which the foam is deposited to adopt the foam of a web of rectangular cross-section, the container comprises a front wall, a rear wall and two lateral walls wherein lower parts of the rear wall and the front wall approach each other and define a bottom of the container, and the front wall, which is located on the conveyor side, is a curved wall constituted by a cylinder driven in rotation about a horizontal axis in the same direction and at the same speed as the conveyor, and the edges of the lateral walls adjacent the curved wall are circular in contour and partially surround the cylinder in order to allow the relative movement of the cylinder and the said rear and lateral wall to ensure tightness of the container and an assembly composed of the rear wall and lateral walls comprises means for obtaining its pivoting about the axis of said cylinder with a view to raising or lowering said assembly with respect to a horizontal surface in order to modify the volume of the container and to immobilize said assembly in a position after adjustment.

4,559,004

APPARATUS FOR MANUFACTURING BRICKS OF COMPRESSED EARTH

Robert Augier, Sorgues, France, assignor to Societe Anonyme de Recherche et d'Etudes Techniques, France

Filed Aug. 24, 1984, Ser. No. 643,949
Int. Cl.[4] B29C *3/00*
U.S. Cl. 425—261 **15 Claims**



1. A machine for manufacturing building bricks by agglomerating an earth-based material, the machine being of the type comprising:

a frame;

a mold composed of a chamber having side walls that are parallel to a generator direction and a piston which is free to move inside the chamber along the said generator direction under the control of piston actuator means, one end of the chamber being constituted by the said piston and the other end of the chamber comprising an opening of the same section as the chamber;

feed means for feeding said chamber with a compressible earth-based material;

a compression plate suitable for closing the said opening to enable the piston to compress the material contained in the chamber, the said feed means and the said compression plate being fixed to the said frame of the machine;

and means for disengaging the said opening relative to the said plate to enable the compressed product to be removed from the chamber;

the improvements wherein:

the said piston actuator means comprise a pressure driven jack;

moving means are provided for moving the mold, the piston and its actuator means, relative to the frame and successively positioning the mold opening in a first position opposite the said feed means for filling the mold chamber, then in a second position opposite the said compression plate for compressing the mold fill, and then in a third position in which said opening is free from the compression plate and the jack is operative to eject the molded product from the chamber via the opening; and

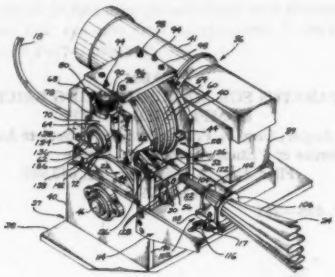
means are provided for turning off the pressure action of the jack prior to moving the said mold, the piston and its activating means from the first position to the second position.

4,559,005

MACHINE FOR FORMING COMPOSITE MATERIAL INTO FILLETS

Wilbur L. Gants, Renton; William T. Kline, Seattle, and Jonathan T. Sneddon, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 24, 1984, Ser. No. 685,531
Int. Cl.⁴ B27C *17/02*
U.S. Cl. 425—363 **15 Claims**



1. A machine for drawing a strip of composite material from a supply source and forming it into a fillet, comprising:

(a) a frame;

(b) a first forming roll rotatably mounted in said frame, said first forming roll containing a plurality of spaced-apart dies formed by grooves located in the peripheral surface of said forming roll;

(c) a second forming roll rotatably mounted in said frame adjacent to said first forming roll such that the peripheral surface of said second forming roll impinges on and frictionally engages the peripheral surface of said first forming roll, the peripheral surface of said second forming roll impinging on the peripheral surface of said first forming roll such that said grooves forming said plurality of spaced-apart dies and said surface of said second forming roll define a series of fully closed orifices, each orifice having a fillet crosssectional shape; and,

(d) drive means for rotating one of said first and second forming rolls, the frictional engagement between said forming rolls resulting in a corresponding rotation of the other of said first and second forming rolls, the rotation of said first and second forming rolls causing a strip of composite material introduced into a selected one of said orifices to be drawn from its supply source and compacted into a fillet shape.

4,559,006

PURGING PROCESS

Eugene C. McGill, Skiatook, and Robert L. Rawlings, Tulsa, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

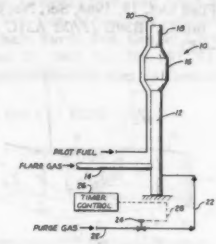
Filed Jun. 22, 1984, Ser. No. 623,845
Int. Cl.⁴ F23J *15/00*; F23D *13/20*
U.S. Cl. 431—3 **8 Claims**

1. An improved purging process for controlling the rate of back flow migration of air into a flare system comprising:

flowing purge gas through the flare system in a sufficient amount to substantially prevent air migration into the exit port through which the purge gas is exhausted to the atmosphere;

ceasing the flow of purge gas to permit substantial air migration to occur, said ceasing of flow gas being for a selected interval of time; and

re-establishing the flow of purge gas at the end of the interval of flow cessation such that only a predetermined



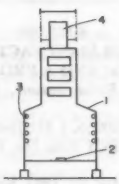
amount of migration air has occurred to prevent harmful conditions from occurring as a result of the air migration.

4,559,007

FUEL BURNING METHOD IN HEATING FURNACE

Mitsuo Hashimoto; Yasuo Watanabe; Fumio Mama, and Akinori Odan, all of Yokohama, Japan, assignors to Nippon Petroleum Refining Company, Limited, Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,066
Claims priority, application Japan, Nov. 4, 1980, 55-153935; Nov. 4, 1980, 55-153936; Nov. 4, 1980, 55-153937
Int. Cl.⁴ F23J *5/00*
U.S. Cl. 431—4 **3 Claims**



1. In a fuel burning method in a heating furnace wherein a substance to be heated is heated at a temperature in the range of from 400° to 800° C. by feeding a liquid fuel and/or gaseous fuel to a burner mounted at the lower portion of the heating furnace and thereat burning the fuel with an abundant supply of oxygen, the improvement which comprises reducing the concentration of nitrogen oxides contained in the combustion gases exhausted from the furnace by feeding into the combustion system the combination of FCC gasoline tank bottom water or water obtained after washing FCC gasoline and an ammonium compound.

4,559,008

STARTING AID DEVICE FOR A HIGH PRESSURE COMBUSTION CHAMBER

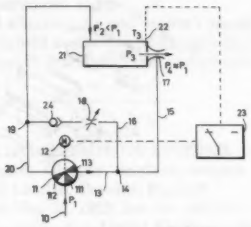
Heinz D. Distelrath, Troisdorf; Herbert Wiegand, Cologne; Klaus Rath, Niederkassel, and Klaus Bäumer, Bonn, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft-und Raumfahrt e.v., Cologne, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,540
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301355
Int. Cl.⁴ F23N *5/00*
U.S. Cl. 431—63 **17 Claims**

1. A starting aid device for a high pressure combustion chamber having a pressure inlet, a supply air line connected to the pressure inlet, and a combustion chamber outlet, comprising a device for reducing the flow velocity through the com-

bustion chamber outlet at a low combustion chamber temperature, wherein the combustion chamber outlet has a slot nozzle connected to a blocking air line, and through which, at a low combustion chamber temperature, air can be injected into the combustion chamber outlet in counterflow to the exhaust flow; and

wherein an inlet air line is connected via a valve arrange-



ment with the supply air line and the blocking air line such that, in one position of the valve arrangement, the supply air line is connected to the inlet air line and the blocking air line is blocked, and in another position of the valve arrangement, the supply air line is connected via a pressure reducer to the inlet air line while the blocking air line is connected with no essential fall in pressure to the inlet air line.

4,559,009

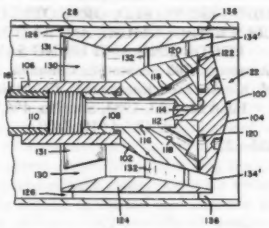
AGGREGATE DRYER BURNER

John A. Marino, Palmyra; Roderick G. Strohl, Jr., Annville, and Robert B. Yost, Bethel, all of Pa., assignors to Hauck Manufacturing Company, Lebanon, Pa.

Continuation of Ser. No. 405,765, Aug. 6, 1982, abandoned, which is a continuation of Ser. No. 157,434, Jun. 9, 1980, abandoned. This application Sep. 12, 1984, Ser. No. 649,975

Int. Cl.⁴ F23M 9/00

U.S. Cl. 431—184 **20 Claims**



1. A burner including an axial fuel pipe;

a fuel atomizer at the downstream end of the pipe;

a primary air pipe coaxial with the fuel pipe, surrounding the fuel pipe and extending upstream from the fuel atomizer;

a secondary air pipe coaxial with the fuel pipe, surrounding the primary air pipe and extending upstream from the atomizer;

said secondary air pipe having an exit portion extending parallel to the axis of said fuel pipe;

means for swirling primary air in a first direction; said means for swirling primary air including means adjacent said fuel atomizer defining two separate concentric swirl passages dividing the primary air into two flow masses, the first of said primary swirl passages configured to accelerate the flow of a first primary air mass therethrough in a swirling motion, the second of said primary swirl passages configured to impart a slower swirling motion to a second primary air mass flowing therethrough such that said second air mass flows faster axially than said first air massto thereby provide strong sheer atomization of fuel near said fuel atomizer upon engagement of the respective swirling air masses;

the inner one of said separate concentric primary swirl passages having an exit portion diverging away from said atomizer and the outer of said primary swirl passages having an exit portion extending parallel to the axis of said fuel pipe;

means for swirling secondary air in said first direction, said secondary air swirling means being adjustable to provide a varying degree of swirl in said secondary air; and

a damper assembly joining the primary and secondary air pipes including an outer duct connected to said primary and secondary air pipes at an angle such that primary and secondary air respectively are directed with a minimum pressure drop to each respective primary and secondary swirling means, the duct having an upstream mouth adapted to be connected to a souce of combustion air, an interior wall dividing the duct into a primary air passage and a secondary air passage, both passages communicating with the upstream duct mouth, the primary air passage communicating with the primary air pipe, the secondary air passage communicating with the secondary air pipe, a first damper within the primary air passage to control the flow of primary air therethrough, a second damper within the secondary air passage to control the flow of secondary air therethrough.

4,559,010

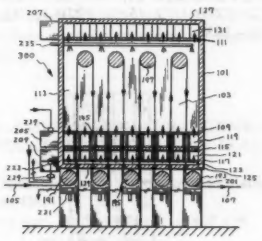
APPARATUS FOR PRODUCING OXIDIZED FILAMENTS

Kosuke Katsuki, and Yukihiro Murakami, both of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,248

Int. Cl.⁴ F27B 9/28

U.S. Cl. 432—59 **15 Claims**



1. An apparatus for continuously producing continuous oxidized filaments, which comprises:

(a) a furnace having a heated oxidizing gas atmosphere therein, into which continuous precursor filaments are continuously introduced, in which the precursor filaments are converted into the oxidized filaments and from which the oxidized filaments are continuously drawn out,

(b) an inlet provided at the furnace, for introducing the precursor filaments into the furnace,

(c) an outlet provided at the furnace, for drawing out the oxidized filaments from the furnace,

(d) a treating chamber provided in the furnace, for oxidizing the filaments,

(e) a gas introduction chamber provided in the furnace at the outside of the treating chamber, for introducing the heated oxidizing gas into the treating chamber,

(f) a gas exhaust chamber provided in the furnace at the outside of the treating chamber and the opposite side of the gas introduction chamber, for drawing off a major part of the gas from the treating chamber,

(g) a sealing gas exhaust chamber provided in the furnace at the outside of the gas introduction chamber and the oppo-

site side of the treating chamber, for drawing off a part of the gas from the treating chamber and air introducing into the furnace from the outside thereof,

(h) a first duct connected to the gas introduction chamber, to provide positively a flow of the heated oxidizing gas into the gas introduction chamber,

(i) a second duct connected to the gas exhaust chamber, to provide positively a flow of the gas from the gas exhaust chamber,

(j) a conduit connected to the sealing gas exhaust chamber, to provide positively a flow of the gas from the sealing gas exhaust chamber,

(k) an injecting means communicated with the conduit, for injecting water into the conduit, and

(l) a shutting means provided in the conduit, for shutting the flow of the gas in the conduit.

4,559,011

COOLING ARRANGEMENT FOR SHAFT FURNACES

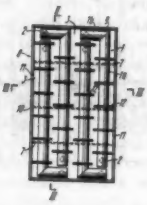
Lev D. Gritsuk; Anatoly S. Gorbik; Leonid D. Golod; Dorina B. Kutsykovich; Kazimir D. Bashinsky; Sergei V. Samofal, all of Kharkov; Igor M. Peftiev; Viktor P. Bogoditsa, both of Donetskaya; Alexandr N. Kulagin, Donetskaya; Gennady E. Goryainov; Jury G. Bannikov, both of Kharkov; Semen M. Liderman, Kharkov; Georgy V. Nikolaev, Kharkov; Vitaly N. Mischenko, Kharkov; Valentin V. Gromenko, Kharkov; Alexei M. Kamardin, and Nikolai S. Kobets, both of Donetsk, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Pozovaniju Vtorichaykh Energoresursov Predpriyaty Chernoi Metallurgii "Vnipichermetenergoochistka", Kharkov, U.S.S.R.

PCT No. PCT/SU82/00017, § 371 Date Jan. 16, 1984, § 102(e) Date Jan. 16, 1984, PCT Pub. No. WO83/04266, PCT Pub. Date Dec. 8, 1983

PCT Filed May 27, 1982, Ser. No. 576,397

Int. Cl.[4] F27D *1/12, 15/02;* F22B *37/00;* C21B *7/10*

U.S. Cl. 432—233 **14 Claims**



1. A cooling arrangement for shaft furnaces comprising:

(a) at least two spaced apart metallic cooling tubes arranged in the cooling arrangment in a position adjacent to a shell side of the shaft furnace, said cooling tubes substantially parallel to a longitudinal generating line of said shell side;

(b) at least two tie plates interconnecting said cooling tubes, each of said tie plates is tangentially welded to an adjacent tube of said cooling tubes with one edge portion of said tie plate along a generatrix of one surface of said adjacent tube of said cooling tubes on said shell side and said tie plates are adjacently arranged and separated by a spacing along a height of said cooling arrangement which extends laterally along a length of said tie plate;

(c) a refractory material filling a space between said cooling tubes and said tie plates; and

(d) a metallic frame embracing a perimeter of said cooling arrangement having a vertical wall extending along said cooling tubes, said wall being slotted along an entire width to compensate for heat expansion.

4,559,012

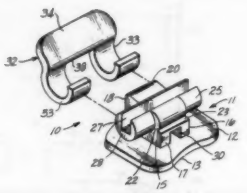
ORTHODONTIC BRACKET

Erwin C. Pletcher, P.O. Box 3054, Rancho Santa Fe, Calif. 92067

Filed Dec. 6, 1984, Ser. No. 678,707

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—10 **9 Claims**



1. An orthodontic bracket assembly, comprising:

a bracket body having a base, the body defining a bearing member having a slot to receive an arch wire, the body further having a surface forming a ledge, the surface extending first away from the base, slot and ledge, and then toward the slot to form a detent; and

a locking member with a hub having a mesiodistal passage therethrough configured to receive the bearing member so the hub fits captively and rotatably over the bearing member, the hub having a mesiodistal slot extending therethrough into communication with the passage, and further having a handle extending therefrom;

the locking member being movable between an open position to receive the arch wire through the hub slot into the arch wire slot, and a closed position which misaligns the hub and arch-wire slots to capture the arch wire in the bracket assembly, the locking-member handle making an interference fit over the detent to rest against the ledge in the closed position.

4,559,013

ORTHODONTIC SHIELD, ORTHOTIC DEVICE AND MUSICIAN EMBOUCHURE AID AND METHOD OF PRODUCING AND USING SAME

A. Keith Amstutz, 1700 Senate St., Columbia, S.C. 29201, and Bruce H. Kinnie, 2301 Kneece Rd., Columbia, S.C. 29206

Filed May 23, 1983, Ser. No. 496,910

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—22 **12 Claims**

1. A method of producing an orthodontic shield for use as an embouchure aid to reduce or eliminate cuts, abrasions and/or irritations incurred by a wearer of braces or other orthodontic appliances while playing a wind instrument, comrising:

a. placing a quantity of medical silicone composition over teeth, braces, orthodontic appliances and other sources of oral irritations;

b. allowing said silicone to set and form so as to leave an

impression in said silicone shaped by said teeth, braces, or orthodontic appliances;

c. removing said silicone from said wearer's mouth;

d. trimming said silicone to a size and shape which will protect said wearer's lips, gums and mouth tissue from said braces, orthodontic appliances or other sources of oral irritation while not impairing movement or vibration of said lips, gums or mouth tissue during the playing of said wind instrument; and

e. placing said silicone into said wearer's mouth with said silicone being held in place by said braces or other orthodontic appliances fitting into said impression in said silicone.

4,559,014

MOTION LIMITING SYSTEMS

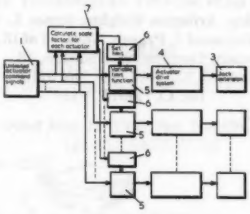
Douglas R. Campbell, Glasgow, Scotland, assignor to Rediffusion Simulation Limited, Crawley, England

Filed May 20, 1983, Ser. No. 496,509

Claims priority, application United Kingdom, May 25, 1982, 8215218

Int. Cl.⁴ G09B *9/08*

U.S. Cl. 434—58 **7 Claims**



1. A system for limiting the motion of the motion platform of a vehicle simulator in which the motion platform is supported on a plurality of extensible members which are simultaneously moved to change platform position or velocity or acceleration, the movement of the members for achieving these changes being controlled by commands initiated by a user of the simulator, comprising means for determining at least one absolute limit for at least one parameter of the extension of each of the members, and means for maintaining said at least one parameter within said at least one limit, characterised by means for monitoring the commanded or actual magnitude of said parameter in respect of each member relative to the said absolute limit for that member, means for determining the member for which the monitored relative magnitude is the greatest; calculating means for scaling down the said absolute limit determined for each of the other members to produce separate respective control signals for the separate extensible members such that a movement of the motion platform which causes said parameter for any one member to reach its absolute limit also causes each of the other members to reach its scaled down limit at the same time, and an actuator drive system for each extensible member responsive to respective ones of the control signals for controlling the motion of said motion platform with all extensible members moving at interrelated increments per period of time causing them to reach the maximum extension limits at the same time.

4,559,015

METHOD AND MEANS OF TESTING AND REFINING BICYCLE RIDING SKILLS

Arthur Felesky, 3240 Shelby Dr., Los Angeles, Calif. 90034

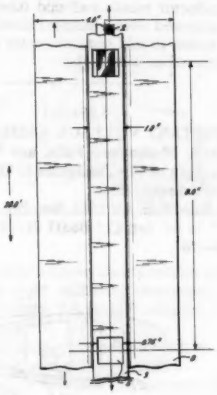
Filed Jul. 9, 1984, Ser. No. 629,105

Int. Cl.⁴ G09B *19/16*

U.S. Cl. 434—61 **3 Claims**

1. An elongate track structure for use as a bicycle riding track and for testing and refining bicycle riding skills and comprising

(a) at least two layers of substrate rubber or vinyl which enclose two layers of two-sided insulation tape which in turn enclose two layers of conductive surface tape enclosing a single layer of insulator material, in which square holes are placed at intervals allowing for electrical signal contacts to be made when pressure is placed on said track,



(b) a means for electrical connections to pass from the track structure to a hand-held scoring device,

(c) a means for electrical connections to activate a buzzing mechanism built into the track structure,

(d) a hand-held scoring device which can be manually turned on and automatically activated by pressure on the track to produce a numerical score on an enclosed LCD counter display.

4,559,016

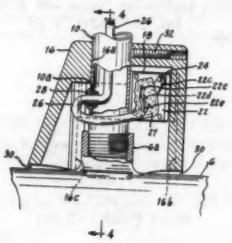
MOUNTING AND COOLING ARRANGEMENT FOR SEMICONDUCTOR SWITCH OF AN ELECTRIC OUTBOARD MOTOR

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 30, 1984, Ser. No. 605,458

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—6 **7 Claims**



1. In an electric outboard motor having an upper controller unit and a submersible watertight lower drive unit joined together by a hollow tube, said lower unit comprising a watertight housing mounted on an end of said tube and having an electric motor in said housing and said controller unit having control means for varying the speed of said motor, the improvements comprising:

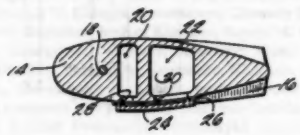
a watertight semiconductor switch for said control means;
means attached to said tube externally of said lower unit for mounting said semiconductor switch in proximity to said lower unit externally thereof;
an aperture in a sidewall of said tube proximate said mounting means;
conductor means within said tube and extending externally thereof through said aperture for electrically connecting said semiconductor switch to said control means; and
first sealing means for effecting a watertight seal between said conductor means and said tube and second sealing means disposed over electrical connections of said conductor means to said semiconductor switch for rendering said connections watertight.

4,559,017

CONSTANT VOLTAGE ANODE SYSTEM

David T. Cavil, Menomonee Falls, and William R. Krueger, West Allis, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 12, 1983, Ser. No. 531,462
Int. Cl.⁴ B63H *21/24*
U.S. Cl. 440—76 **10 Claims**



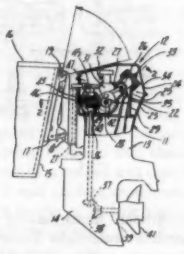
1. The combination with a marine drive unit having a lower housing exposed to sea water and having an internal passage also exposed to sea water, of means providing cathodic protection to said lower housing, comprising,
an aperture between an outside surface of the housing and an inside surface of the passage, an anode mounted on one of the surfaces and exposed to the adjacent conditions and also exposed to the conditions adjacent the other surface.

4,559,018

OUTBOARD MOTOR

Ryoji Nakahama, Iwata; Norimichi Harada; Seiji Wada, both of Shizuoka; Yoshio Hosono, Hamamatsu; Tetsuya Tomoda, Mori, and Susumu Yukishima, Shizuoka, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed May 25, 1983, Ser. No. 498,166
Claims priority, application Japan, Jul. 5, 1982, 57-115484
Int. Cl.⁴ B63H *21/26*
U.S. Cl. 440—77 **26 Claims**



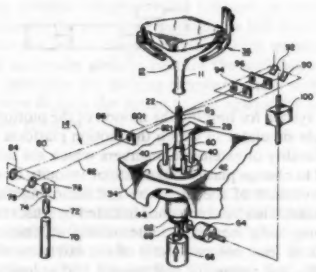
1. In an outboard motor having a power head containing an internal combustion engine, a housing depending from said power head and containing a drive shaft rotating about a generally vertically extending axis, a lower unit journaling a propeller driven for rotation about an axis generally perpendicular to said drive shaft axis by said drive shaft, and means for detachably connecting said motor to the hull of an associated watercraft and for permitting pivotal movement of said motor relative to said hull about a generally horizontally disposed tilt axis and about a generally vertically extending steering axis defined by a steering shaft, the improvement comprising said engine being disposed with its output shaft extending in non-parallel, non-alignment relation with said drive shaft, means for driving said drive shaft from said engine output shaft, the upper end of said steering shaft being juxtaposed to said tilt axis, said tilt axis being disposed contiguous to the uppermost surface of said power head when said outboard motor is in a tilted down state, the upper surface of said power head not extending above a horizontal plane substantially parallel to the upper edge of the hull of the associated watercraft when attached thereto and in a tilted down state, means for directly affixing said engine to said steering shaft at the upper end of said steering shaft and means for affixing said housing to said steering shaft adjacent the lower end of said steering shaft.

4,559,019

AUTOMATIC GUN MOUNT ALIGNMENT APPARATUS

James R. Fendley, Arlington Heights; James L. Kraner, Barrington, and Raymond J. Pekosh, Niles, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 12, 1983, Ser. No. 512,874
Int. Cl.⁴ H01J *9/18*
U.S. Cl. 445—67 **8 Claims**



1. For use at a gun-seal assembly station employed in the processing of a color television cathode ray tube bulb, apparatus for automatically aligning a tri-beam electron gun mount relative to the phosphor pattern deposited upon the target surface of the face panel of said bulb, said pattern having a defined axis, said assembly station having means for supporting said bulb so that said defined axis of said phosphor pattern is established and maintained in a reference position, said gun mount including an electrode structure having an unobstructed passage therethrough, the central axis of said passage being substantially perpendicular to the geometric axis of said mount, said alignment apparatus comprising:
means for supporting said gun mount, with its geometric axis substantially coincident with an extension of the neck axis of said bulb, for rotation about its said geometric axis;
a driver for rotating said gun mount support means;
a source of coherent electromagnetic radiation for developing a beam of spatially coherent light;
beam expander means responsive to the output of said source for producing an expanded beam of substantially collimated light;
a beam splitter responsive to the output of said beam expander means for deriving first and second relatively stable, in time, beams of substantially collimated light;
means for directing said first and second beams along separate

paths which extend through and intersect within said electrode structure optical passage;

means interposed between said beam splitter means and said electrode passage for truncating the transverse extent of said first and second beams;

first and second light detector devices terminating said first and second beam paths and individually responsive to an assigned one of said first and second truncated beams, subsequent to their partial transmission through said electrode optical passage, for developing respective first and second detector signals each of a magnitude proportional to the quantity of intercepted collimated light energy instantaneously transmitted through said electrode optical passage; and

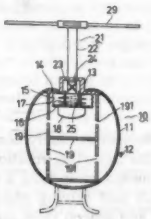
error detector means responsive to said detector signals for developing a resultant control signal for application to said gun mount driver said resultant control signal having a magnitude and a sense determined by the algebraic difference of said detector signals, said control signal effective to induce rotation of said gun mount driver in a direction to produce a substantially identical signal from each of said detector devices thereby establishing optimal gun mount orientation relative to said defined axis of said phosphor pattern.

4,559,020

INFLATABLE TOY WITH MOVABLE MECHANISM

Cheng-Chung Wang, 7th Floor, No. 37, An-Ho Rd., Taipei, Taiwan

Filed May 13, 1983, Ser. No. 494,318
Int. Cl.⁴ A63H *27/00*
U.S. Cl. 446—232 **1 Claim**



1. An inflatable article comprising:

an envelope having a wall made of a gas impervious flexible material which has a resilient portion and which has an opening in a portion of said wall;

means for inflating said envelope;

a flexible hollow member having an open end sealingly connected to said wall and communicated with said opening, said hollow member having a closed end projecting into said envelope from said wall;

a spring member disposed in said hollow member for providing a resiliency;

a rigid hollow external support member, in communication with said flexible hollow member, projected from and connected to said wall at an adjacent position thereon relative to said flexible hollow member;

an internal supporting member inside said envelope and attached to said wall;

a linearly movable element provided inside said envelope and connected to said closed end of said hollow member; and

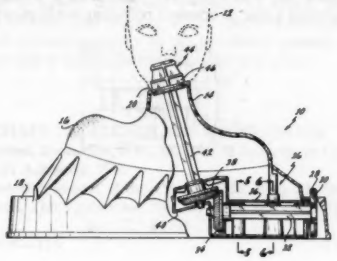
an external rotary assembly having a rotating part held by said external supporting member, the rotary assembly including a rotatable shaft having an endless helical thread provided thereon and an axially movable sleeve member and an engaging member engaged with said thread.

4,559,021

POSEABLE DOLL HEAD

Mark S. Wittenberg, Anaheim, and Virgil W. Wulff, Fullerton, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 27, 1983, Ser. No. 565,507
Int. Cl.⁴ A63H *11/00*
U.S. Cl. 446—352 **1 Claim**



1. An improved stand supporting a poseable doll's head for dressing by a young child, said stand comprising:

a base having a bottom flat surface adapted to stand on a further flat surface;

a pair of shoulders supported on said base;

a neck supported on said shoulders; and

a doll's head having a face and hair permanently affixed to said head around said face moveably mounted on said neck at an angle formed by a cut through said neck, said head being movable about said cut by the action of an actuating means held within said base; said actuating means extending from said base and coupled to a neck plug held within said head at said cut for selected movement of said head, said actuating means being mounted within a housing held internally of said base, and including an operating knob rotatable on a horizontal axis and extending partially out of an opening formed in said base; said operating knob being fixed to one end of a first shaft disposed on a horizontal axis, with the other end of said first shaft connected to a first bevel gear, supported within an extension to said housing, said first bevel gear coacting with a second bevel gear held in said extension to said housing at an obtuse angle, and a second shaft connected at one end to said second bevel gear, with the other end of said second shaft coupled to said neck plug and rotatably carried at said cut through said neck, whereby said head may be moved by a young child to a predetermined position by rotating said operating knob with a single finger to cause the head to turn about said angled cut, to look up or down with said respect to said base while the child focuses attention on the head and uses the other hand to dress the head.

4,559,022

TOY VEHICLE WITH SIMULATED HEADLIGHTS

Barry S. Herstein, Spring Valley, and Anthony J. Mondini, New York, both of N.Y., assignors to Buddy L Corporation, New York, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,719
Int. Cl.⁴ A63H *17/28*
U.S. Cl. 446—438 **5 Claims**

1. A toy vehicle comprising:

A. front and rear wheel sets;

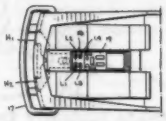
B. a DC motor operatively coupled to at least one of the wheel sets;

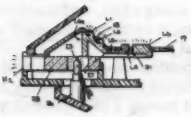
C. a battery connectable to said motor to power same;

D. A single light bulb shunted across the motor, said bulb being energized by the battery when the motor is powered thereby;

E. a first light guide section formed of transparent plastic

material having light conducting properties, said guide section being contoured to define a main block having an opening therin forming an optical light inlet which surrounds said bulb and a pair of legs extending in opposite directions from one end of the block, each leg terminating in a forwardly-projecting foot having a flat face disposed at the front of the vehicle to form an optical outlet simulating a headlight, said light guide at the junction of the block and legs being provided with a V-shaped notch forming a pair of opposed reflecting surfaces which cause





the light beam from the inlet to split into two sub-beams which are directed into the respective legs, each leg having at its end opposite the flat face an inclined face directing the sub-beam toward the flat face; and

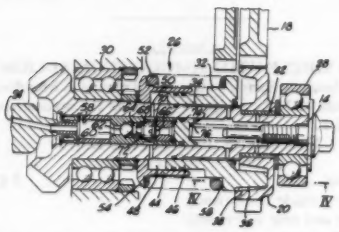
F. a dashboard panel having apertures therein through which extend projections from a contoured second light guide section which overlies the first section and also receives light from the bulb, whereby when the headlights are illuminated, so are the projections which act as dashboard light indicators.

4,559,023

TORQUE DAMPER

Kouichi Uchibaba, Saitama; Tsutomu Hayashi, Tokyo; Haruo Ishikawa, and Kouhei Ohzono, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,601
Claims priority, application Japan, Mar. 23, 1983, 58-47178
Int. Cl.[4] F16D 7/02
U.S. Cl. 464—30 **14 Claims**



1. A torque damper for a power train having an engine with a lubricant supply system, comprising

first and second coaxially arranged drive members, said first drive member being fixed to rotate with and being mounted to slide axially relative to said second drive member;

a sleeve fixed about said second drive member;

a piston fixed to said first drive member and extending into said sleeve to form a variable volume chamber; and

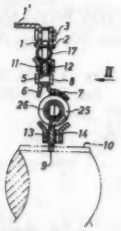
a passage in said second drive member being in communication with the lubricant supply system and said variable volume chamber, said passage including a check valve restricting flow communication toward said lubricant supply system, a flow restricter in said passage and an accumulater piston, said passage being in communication with said variable volume chamber between said check valve and said flow restricter and said flow restricter being between said check valve and said accumulater piston.

4,559,024

VIBRATION DAMPER ASSEMBLY

Kazuhisa Tamura; Kazumi Iida, and Masahiko Koshimo, all of Osaka, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Oct. 26, 1982, Ser. No. 436,804
Claims priority, application Japan, Oct. 30, 1981, 56-174726
Int. Cl.[4] F16D 3/66
U.S. Cl. 464—63 **6 Claims**



1. A vibration damper assembly comprising:

a driving plate for imparting rotational torque;

an outer cover means comprising a first main cover formed integrally with said driving plate and a first sub-cover connected to and spaced from said first main cover by a stop pin;

an annular first hub arranged between said first main cover and said first sub-cover;

an inner cover means comprising a second main cover and a second sub-cover fixed to opposite sides of the inner periphery of said first hub;

a second hub arranged between said second main cover and said second sub-cover and fixed to an output shaft for transmitting rotational torque;

a first-stage elastic means arranged between outward extending arms formed on said first hub and said outer cover means, said outward extending arms having wide spaces therebetween whereby said first stage elastic means may be arranged to be circumferentially long so that the torsion angle can be increased;

a second-stage elastic means arranged between outward extending arms formed on said second hub and said inner cover means;

first friction means arranged between said first hub and said first main cover and sub-cover to provide a first hysteresis, and second friction means arranged between said second hub and said second main cover and sub-cover to provide a second hysteresis; and

a stopper portion extending radially outwardly from the outer peripheral edge of at least one of said outward extending arms formed on said first hub and arranged to engage said stop pin when said outer cover means is ro-

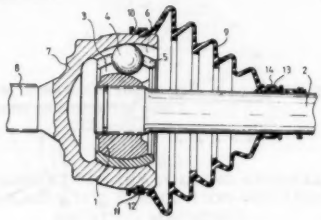
tated with respect to said first hub by rotational torque applied to said driving plate whereby said first stage elastic means acts to provide said first hysteresis over a large torsion angle.

4,559,025

UNIVERSAL JOINT WITH BELLOWS SEAL AND VENT

Jacques P. Dore, Colombes, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Apr. 3, 1984, Ser. No. 596,421
Claims priority, application France, Apr. 15, 1983, 83 06512
Int. Cl.⁴ F16D *3/84*
U.S. Cl. 464—175 **6 Claims**



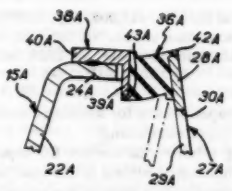
1. A universal joint comprising:
an inner element fixed to a driving shaft;
an outer element fixed to a driven shaft and coupled with said inner element for joint rotation therewith;
a bellows seal connected to one end with said outer element and having a sleeve to an opposite end thereof surrounding said driving shaft and directly contacting same; and
a device communicating between the interior of said bellows seal and the atmosphere external of said bellows seal, said device comprising a cylindrical segment interposed between only a portion of said sleeve and said driving shaft, said cylindrical segment having an axially extending portion of relatively smaller circumferential width connected to a portion of relatively greater circumferential width, said segment being provided with an inner surface abutting said shaft and formed with a groove open toward said shaft having a rectilinear axially extending stretch in said axially extending portion communicating with said interior of said bellows seal and a meandering stretch forming a baffle in said portion of relatively greater circumferential width communicating with the external atmosphere.

4,559,026

SPEED VARIATION PULLEY

Didier Pitoiset, Montmorency, France, assignor to Valeo, Paris, France

Filed Nov. 17, 1982, Ser. No. 442,243
Claims priority, application France, Nov. 18, 1981, 81 21590
Int. Cl.⁴ F16H *11/06*
U.S. Cl. 474—14 **23 Claims**



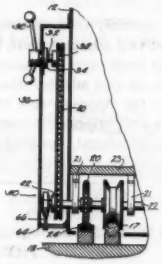
1. A speed variator pulley comprising a hub, two annular plates disposed facing one another and around the hub, at least one of said plates, referred to as the movable plate, being mounted for axial movement relative to the hub under the control of resilient return means comprising an annular diaphragm, said diaphragm comprising on the one hand a peripheral portion forming a dished plate spring, which axially bears so as to rock against the movable plate, and on the other hand a central portion divided by slots into radial fingers and axially bearing so as to rock against a support member fastened axially to the hub, wherein between the diaphragm and the movable plate there is axially interposed a spacer of elastic material forming a rocking axial support, which spacer is fastened both axially and circumferentially to the peripheral portion of the diaphragm and at least axially to the movable plate.

4,559,027

CHAIN TIGHTENER FOR DRIVE CHAIN

John A. Sattel, Janesville, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Continuation-in-part of Ser. No. 380,653, May 21, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,130
Int. Cl.⁴ F16H *7/14*
U.S. Cl. 474—116 **4 Claims**



1. In a mobile storage apparatus adapted for rectilinear movement along guide tracks and having a frame; an elongated shaft mounted for rotation in the frame within a plurality of fixed shaft supports; drive means on the shaft for driving the mobile storage apparatus along the guide tracks; a manually operable member; a first sprocket on the manually operable member; a second sprocket on the shaft; and a chain connecting the sprockets,
the improvement comprising;
deflecting means for deflecting the shaft relative to the fixed shaft supports at a location adjacent the second sprocket and remote from the fixed shaft supports to adjust the tension of the chain without moving the fixed shaft supports.

4,559,028

ADJUSTMENT PITCH SPROCKET

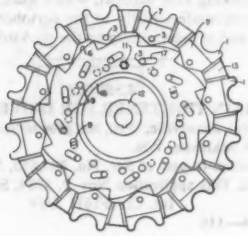
James B. Reeves, Jr., 1315 Whitman Dr., Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 512,540, Jul. 11, 1983, Pat. No. 4,531,926. This application May 17, 1984, Ser. No. 611,111
Int. Cl.⁴ F16H *55/12*
U.S. Cl. 474—162 **21 Claims**

1. An adjustable sprocket, to be used in a chain drive, to compensate for chain and tooth wear by selective adjustment to move tooth portions of the sprocket radially outward, comprising:
an adaptor disc having means for mounting the disc for rotation about a sprocket axis;
a plurality of separate individual sprocket teeth;
means mounting each of said teeth on said adaptor disc to be fixed in the rotational direction of the disc and the axial direction of the disc, and for radial relative adjustment motion between the teeth and adaptor disc;

adjustment means mounted on said disc for driving each of said teeth radially outward to adjust the teeth and compensate for both tooth and chain wear; and

means for selectively locking said teeth fixedly to said disc in an adjusted position to produce a rigid sprocket assembly, and unlocking said teeth selectively to permit said radial adjustment motion between said teeth and said adaptor disc, including



wedge means movably mounted on said adaptor disc between at least two adjacent teeth for tightly peripherally clamping said teeth onto said adaptor disc, and

abutment means on said adaptor disc between two adjacent teeth and on the opposite side of one tooth from said wedge means for peripherally engaging said one tooth in opposition to peripheral clamping pressure of said wedge means.

4,559,029

ENDLESS POWER TRANSMISSION V-BELT CONSTRUCTIONS

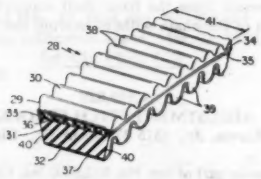
Joseph P. Miranti, Jr., Nixa; Mark P. Foley, Springfield; Gerald C. Hollaway, Springfield; Larry R. Oliver, Springfield; Paul M. Standley, Springfield, and James A. Lewis, Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 522,422, Aug. 11, 1983, Pat. No. 4,494,947, which is a division of Ser. No. 348,106, Feb. 11, 1982, Pat. No. 4,410,314. This application Sep. 26, 1984, Ser. No. 654,830

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[4] F16G *1/28*

U.S. Cl. 474—251 **20 Claims**



1. In an endless power transmission V-belt construction formed mainly of polymeric material and having top teeth and bottom teeth respectively extending along the length of the top and bottom surfaces of said belt construction, said belt construction comprising a tension section having said top surface, a compression section having said bottom surface, a load-carrying section disposed intermediate said tension section and said compression section, and the quotient of the top width to belt thickness is about 2–4, the improvement wherein the quotient of the bottom to top tooth pitch is about 1.25, the quotient of the bottom to top tooth depth is about 1.92, the quotient of the belt thickness to flex thickness is about 3.68, the belt thickness is about 0.313 inch, and the flex thickness is about 0.085 inch.

4,559,030

APPARATUS FOR FOLDING JACKET MATERIAL

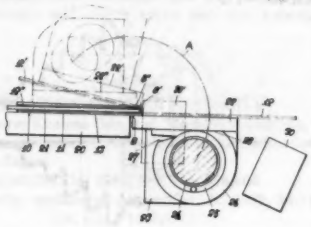
Akira Tada, Toyonaka, and Koichi Tanigawa, Kawanishi, both of Japan, assignors to O-M Limited, Osaka, Japan

Filed Nov. 16, 1983, Ser. No. 552,242

Claims priority, application Japan, Nov. 19, 1982, 57-204347

Int. Cl.[4] B31B *1/28, 1/56*

U.S. Cl. 493—252 **3 Claims**



1. An apparatus for folding a jacket material, comprising:

(a) an upper shaft and a parallel lower shaft, each having opposite ends;

(b) arm means, mounted on the opposite ends of the upper and lower shafts, for connecting the shafts together;

(c) table means, arranged adjacent to the upper shaft, for supporting the jacket material;

(d) bar means, mounted on the upper shaft, for folding the jacket material over substantially 180°, forming a folded corner at one end of the jacket material, and rubbing the jacket material;

(e) insertion means, provided above the table means, for placing a liner into the folded jacket material;

(f) a supporting rod having two ends with one end being mounted on the lower shaft; and

(g) heater bar means, mounted on the end of the supporting rod opposite from the one end which is mounted on the lower shaft, for reciprocating in an arc about the lower shaft into and out of heat-pressing contact with the folded corner of the jacket material after the folded corner is formed and before the jacket material is rubbed by the folding bar means.

4,559,031

PASSIVE PAPER STACKER

Peter Gysling, Boise, Id., and Sohrab Vossoughi, Vancouver, Wash., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 415,005, Sep. 7, 1982, abandoned, which is a continuation of Ser. No. 205,400, Nov. 10, 1980, abandoned. This application Apr. 23, 1985, Ser. No. 725,530

Int. Cl.[4] B31B *1/00*

U.S. Cl. 493—410 **7 Claims**

1. A passive paper stacker for stacking a series of pages of a sheet of Z-fold paper comprising:

a base having a horizontal surface for supporting stacked pages, the horizontal surface of the base having a gap for receiving only the first page of the series of pages;

an exit ramp positioned above the base for guiding the series of pages toward the base; and

a starter ramp having a sloping concave upper surface extending from and directly beneath the gap, the upper

surface including means to force the first page to curl, thereby forcing the fold between the first and second

pages to come to rest substantially at an outer edge of the horizontal surface of the base.

4,559,032

MULTI-SHEET ROTARY FOLDING APPARATUS, PARTICULARLY FOR ASSOCIATION WITH ROTARY PRINTING MACHINES

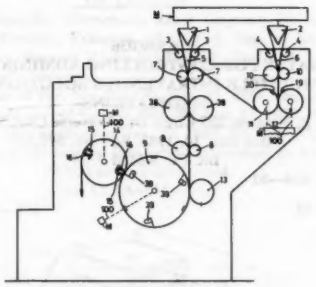
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,521

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3151283

Int. Cl.⁴ B65H *45/16*; B41F *13/56*

U.S. Cl. 493—432 **13 Claims**



1. Printed sheet rotary folding apparatus, particularly for association with a rotary printing machine having

a folding station including a folding blade cylinder (9, 46) and a folding gripper cylinder (14, 50);

means for feeding a plurality of stacked, superposed sheets to the folding station, and

comprising, in accordance with the invention,

means for preventing sticking of a folded inner sheet on the folding blade including

a punch apparatus (19, 20; 48, 49) positioned in advance—in the direction of travel of the sheets—of the folding sheet cylinder (14, 50) arranged to cut at least one window (37) in the region of the fold line from those sheets of the stack which, upon folding, will be the outer folded sheets;

and projecting grippers (30) positioned in the folding sheet cylinder located to pass through the at least one window of the folded outer sheets and gripping the inner sheet, so that the inner sheet will be held by said projecting grippers and retained in the folding cylinder even upon withdrawal of the folding blade;

means for actuating the grippers; and

means (100) for coordinately rotating the folding blade cylinder (9, 46) and the folding gripper cylinder (14, 50) and operating the means for actuating the grippers (30).

4,559,033

APPARATUS AND METHODS FOR MINIMIZING PERITONEAL INJECTION CATHETER OBSTRUCTION

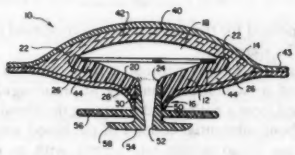
Robert L. Stephen; Carl Kublitz; Barry K. Hanover; Stephen C. Jacobsen, and Jeffrey J. Harrow, all of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 200,830, Oct. 27, 1980, Pat. No. 4,400,169, which is a continuation-in-part of Ser. No. 235,185, Feb. 17, 1981, Pat. No. 4,405,305. This application Aug. 12, 1983, Ser. No. 522,907

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ A61M *5/00, 31/00*

U.S. Cl. 604—49 **56 Claims**



1. A subcutaneously implantable injection conduit for injecting a drug into a peritoneal cavity, comprising:

a hollow receptacle for receiving the drug, the hollow receptacle having a penetrable portion;

a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the receptacle such that the stem forms a passageway extending from the chamber;

a first substantially diametrally enlarged flange attached to the stem such that, when the conduit is implanted under a layer of skin adjacent the peritoneal cavity and the first flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is positioned within the peritoneal catheter; and

structural means for inhibiting cell growth which would inhibit flow through the hollow stem comprising a second substantially rigid, diametrically enlarged flange attached to the stem within the peritoneal cavity.

26. A subcutaneously implantable injection conduit for injecting a drug into a peritoneal cavity, comprising:

a hollow receptacle for receiving the drug, the hollow receptacle having a penetrable portion;

a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the receptacle such that the stem forms a passageway extending from the chamber;

a first diametrally enlarged flange attached to the stem such that, when the conduit is implanted under a layer of skin adjacent the peritoneal cavity and the first flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is directed toward the mesenteric peritoneal membrane; and

a cellulicidal material for inhibiting cell growth covering at least a part of the hollow receptacle and the hollow stem.

4,559,034

LINE FOR USE IN BODY FLUID TREATMENT

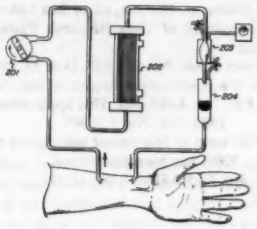
Yasuzo Kirita, Toyonaka; Masaru Kawahashi, Takatsuki; Keiki Kariu; Kimihisa Sunahara, both of Saiki, and Hidemune Naito, Kobe, all of Japan, assignors to Kawasumi Laboratories, Inc., Tokyo and Kuraray Co., Ltd., Kurashiki, both of, Japan

Continuation of Ser. No. 528,234, Aug. 30, 1983, abandoned, which is a continuation of Ser. No. 366,919, Apr. 9, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 559,855

Claims priority, application Japan, Apr. 16, 1981, 56-55667[U]; Jul. 3, 1981, 56-99643[U]

Int. Cl.⁴ A61M *1/03*

U.S. Cl. 604—52 **7 Claims**



1. A method for the extracorporeal treatment of blood comprising the steps of:

providing a circuit without a drip chamber for carrying blood to which substantially no anticoagulant has been added from a patient and returning the blood to the patient without substantial contact of the blood with air;

dialyzing blood within said circuit with an ethylenevinyl alcohol copolymer hollow fiber dialyzer;

passing the blood within said circuit through a tubular blood passageway member in series with said dialyzer, at least part of which is made of a flexible material;

hermetically enclosing the tubular blood passageway member within an outer tubular member made of a nonflexible material;

filling the hermetically closed space between the outside surface of said tubular blood passageway member and said outer tubular member with a fluid; and

detecting changes in the pressure of said fluid caused by inflations and deflations of the flexible portion of the tubular blood passageway produced by changes in the pressure of the blood passing therethrough.

4,559,035

COLLAPSIBLE WOUND SUCTION EVACUATOR

Thomas A. Benjamin, Newcomerstown, and Dean A. Ransom, Dover, both of Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio

Filed Sep. 26, 1983, Ser. No. 535,501

Int. Cl.⁴ A61M *1/06, 37/00*

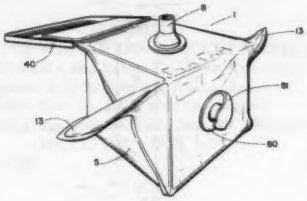
U.S. Cl. 604—73 **37 Claims**

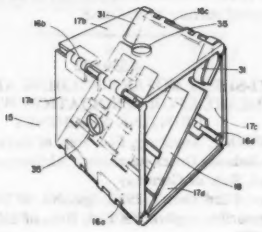
1. A surgical wound evacuator comprising:

a polygonal hollow enclosure having a plurality of substantially planar, rigid walls interconnected by a plurality of hinges so as to be collapsible and expandable;

a flexible fluid tight pouch surrounding said enclosure so as to be collapsible and expandable therewith, said pouch having communicating means permitting fluid evacuation from said pouch therethrough during collapse and fluid suction therethrough during expansion; and

resilient means interconnected between at least two of said hinges, said resilient means permitting collapse of said enclosure and pouch and producing expansion when operably interconnected between said at least two hinges and wherein said resilient means includes a resilient portion and a rigid panel connected to each other to form the





resilient means, said panel extending diagonally between two diametrically located opposite hinges.

4,559,036

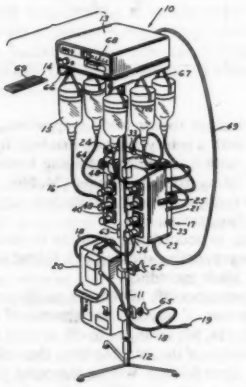
APPARATUS FOR CONTROLLING ADMINISTRATION OF MULTIPLE INTRAVENOUS SOLUTIONS AND MEDICATIONS

Richard E. Wunsch, 207 Circle Dr., Traverse City, Mich. 49684

Filed Dec. 14, 1983, Ser. No. 561,210

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 604—81 **12 Claims**



1. Apparatus for administering a plurality of intravenous solutions comprising:

a solution manifold selector including a manifold plate and a valve plate sandwiched together to define a plurality of channels;

a tubing manifold having a plurality of branches for permit-

ting the selective flow of fluids therethrough, said tubing manifold and branches being disposed in said channels;

said manifold and each of said branches having an inlet, said inlets being adapted for individual connection to the supply tube of a plurality of intravenous solution bottles respectively, and an outlet on said manifold adapted for connection to a fluid dispensing tube mounting a catheter or I.V. needle;

a plurality of spaced valve means mounted upon said valve plate, each valve means including a longitudinally adjustable element in registry with a portion of said manifold and each of said manifold branches, said elements being normally in compressive collapsing registry with the manifold and said branches closing off the flow of fluids therethrough;

electric motor means mounted upon each valve means for retracting a valve element individually opening the manifold or adjacent branch for flow of fluid therethrough, and after a predetermined period successively advancing said valve element to close off the adjacent branch or said manifold, and alternately retracting and after a time delay advancing additional individual valve elements successively in a predetermined sequence;

said valve means further comprising a threaded shaft attached to said valve element, which is advanced by rotating an internally threaded valve stem retained within said valve plate;

said motor means including a reversible electric motor mounted upon each valve means and a drive shaft; and

intermeshing gear means interconnecting said drive shaft and said valve stem.

4,559,037
DEVICE FOR THE PRE-PROGRAMMABLE INFUSION OF LIQUIDS

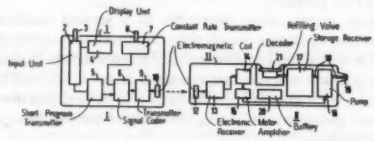
Manfred Franetzki, Uttenreuth; Klaus Gagneur, Bubenreuth, and Karl Prestele, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 238,137, Feb. 25, 1981, abandoned, Continuation-in-part of Ser. No. 969,189, Dec. 13, 1978, Pat. No. 4,282,872. This application Jan. 20, 1984, Ser. No. 572,417

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—151 **30 Claims**



1. Apparatus for the infusion of insulin into a patient's body in diabetes therapy, comprising a microdosing unit for supplying said insulin to the patient's body, control means selectively controlling said microdosing unit to supply respective different amounts of insulin with respective corresponding predetermined insulin infusion profiles as a function of time and with a limited time duration suitable to an individual meal, said control means selectively generating respective control signals which control the supply of the respective different amounts of insulin by the microdosing unit with the respective corresponding predetermined insulin infusion profiles, said control means having an input unit manually operable directly by the patient for entering, in accordance with the carbohydrate content of a meal, a selected input signal corresponding to a respective required amount of insulin to be delivered into the body of the patient, said input unit controlling said control means to supply a respective control signal according to the selected input signal, to said microdosing unit, such that said microdosing unit delivers the corresponding required amount of insulin into the patient's body with the corresponding predetermined infusion profile as a function of time, said input unit having a selection range of input signals corresponding to a range of amounts of insulin such that the amount of insulin selectable by said input unit is individually adaptable to each of the patient's meals.

4,559,038
DRUG DELIVERY SYSTEM

Harvey F. Berg, Stacy; Lyle Peterson, Maple Grove, and James E. Leslie, Mounds View, all of Minn., assignors to Deltec Systems, Inc., St. Paul, Minn.

Filed Oct. 19, 1984, Ser. No. 663,050

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—153 **21 Claims**

1. Modular system for delivering a drug to a patient comprising, in combination: a reservoir module, with the reservoir module comprising, in combination: a container for storing a drug to be delivered by the system, a tube for providing communication between the drug storage container and the patient, and a pressure plate, with the communication providing tube being located and supported on the pressure plate; a control module, with the control module comprising, in combination: a chassis including a first aperture and second and third apertures located on opposite sides of the first aperture; a camshaft rotatably mounted to the chassis having a first cam portion and second and third cam portions located on opposite sides of the first cam portion; an expulsor reciprocably mounted in the first aperture of the chassis for engagement with the first cam portion and for interaction with the communication providing tube; first and second valves reciprocably mounted in the second and third apertures of the chassis for engagement with the second and third cam portions and for interaction with the communication providing tube, and means for rotating the camshaft for reciprocating the expulsor and valves in the apertures of the chassis; means for removably securing the pressure plate of the reservoir module to the chassis of the control module, with the expulsor and the valves of the control module interacting with the communication providing tube on the pressure plate of the reservoir module when the reservoir module is removably secured to the control module for forcing the drug stored in the drug storage container through the communication providing tube at desired rates to the patient.

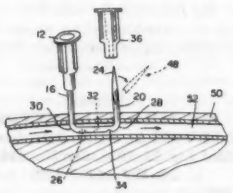
4,559,039
PERMANENTLY PLACED TRANSCUTANEOUS ACCESS DEVICE TO BLOOD VESSELS

Stephen R. Ash, and Geraldine M. Kaufman, both of Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Dec. 5, 1983, Ser. No. 557,827

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—175 **13 Claims**



1. A transcutaneous access device for permanent placement in blood vessels which comprises a unitarily constructed, substantially U-shaped tubular member that includes a first leg having means for connecting the transcutaneous access device to external equipment, a linear mid-portion having at least one

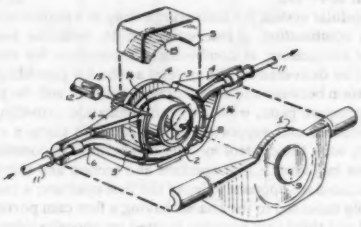
aperture positioned on the periphery thereof, and a second leg terminating in a needle barb, said first and second legs being positioned relative to the mid-portion and to each other so that the first and second legs are generally perpendicular to the mid-portion and the second leg forms an acute angle with a plane that includes the mid-portion and the first leg.

4,559,040

SEGMENTED PERISTALTIC PUMP CHAMBER

Russell Horres, Del Mar, and John W. Moers, Fallbrook, both of Calif., assignors to Pancretec, Inc., San Diego, Calif.

Filed Oct. 30, 1984, Ser. No. 666,554
Int. Cl.[4] F04B *43/08, 45/12*
U.S. Cl. 604—153 **1 Claim**



1. An improved segmented peristaltic pump head of a combination of a stator, eccentric rotor and rotor extremity, resilient tube, associated inlet and outlet ports with tube holding means where the improvement comprises a removable and replaceable pump head with said stator consisting of a rear segment, a front segment, and a cap,

said rear segment housing said eccentric rotor, an arc of less than 300 degrees forming the internal periphery of said rear segment, a tubing track being created by the space between said stator and rotor where said resilient tube is spirally wrapped in said track and held by the tube holding means to said inlet and outlet ports,

said front segment acting as a cover to contain said resilient tube and mating with said rear segment, said inlet and outlet ports and tube holding means being formed by the mating of said front and rear segments,

said cap attaching to the top of the front and rear segments and providing a surface completing a missing chord of said tubing track,

means holding together said front segment, rear segment and cap, whereby when said rear segment, front segment, eccentric rotor, and tube are assembled together without the cap being attached, and the eccentric rotor is oriented to press said resilient tubing into the position of said missing chord with the result that said resilient tubing is not pinched closed so the tubing may be filled and stored ready for use, requiring the attachment of said cap and connection of a rotational drive means to said rotor extremity to deliver liquid medicament to a patient.

4,559,041

CANNULA INTRODUCERS

M. Dean Razi, 5800-49th St. N., St. Petersburg, Fla. 33709

Filed Jun. 25, 1984, Ser. No. 624,298
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—157 **13 Claims**

1. A cannular introducer device for providing a cut in a blood vessel wall and inserting a cannula into such cut comprising,

a handle,

a elongated cutting rod terminating at its distal end in a cutting blade means,

said rod extending distally from said handle and being carried thereby for relative proximal and distal movement,

a tubular rod housing carried by said handle and telescopically receiving at least the distal portion of said cutting rod,

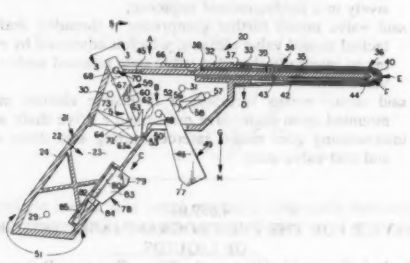
said cutting rod having a cutting position wherein the cutting blade means projects distally from said rod housing and a non-cutting position wherein said cutting blade means is shrouded by the distal end of said rod housing,

an elongated hollow cannula,

cannula supporting means on said handle for releasably supporting said cannula thereon with said cannula extending distally from said supporting means and said cannula telescopically receiving said rod housing and being supported by at least a portion of said tubular rod housing,

trigger means carried by said housing and having a first end graspable by the operator of the device for actuating the same and a second end having operating means thereon,

operated means carried by said handle and being connected to the proximal end of said cutting rod,



said operated means having a first position wherein it maintains said cutting rod in its non-cutting position and having a second position wherein it maintains said cutting rod in its cutting position,

first spring means biasing said operated means towards its first position,

said operating means on said trigger means being operatively connected to said operated means,

said trigger means having a first position wherein the operating means thereon maintains said operated means in the latter's first position,

said trigger means being moveable to a second position wherein the operating means thereon moves said operated means to its second position and said trigger means having a third position wherein said operated means is allowed to be returned by said first spring means to its first position,

and second spring means biasing said trigger means towards its first position.

4,559,042

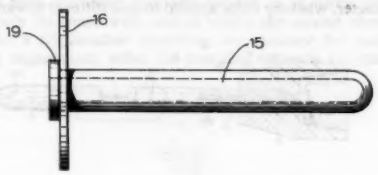
SAFETY ENCLOSURE FOR DISPOSABLE HYPODERMIC SYRINGE NEEDLE

Thomas W. Votel, St. Paul, Minn., assignor to Comp Equipment Corporation, St. Paul, Minn.

Continuation of Ser. No. 362,320, Mar. 26, 1982, abandoned.
This application Jan. 6, 1984, Ser. No. 607,711
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—192 **6 Claims**

1. A safety device for use with a tubular covering having an aperture for a disposable hypodermic syringe, comprising: a finger protecting shield means having a centrally disposed opening for sliding the shield means over the tubular covering, the shield means being flexible and needle puncture resistant, the shield means being removable and is cooperatively held in place proximate the aperture, the shield means extending

radially outward for protecting the hand from needle puncture when the tubular covering is held in one hand behind the shield



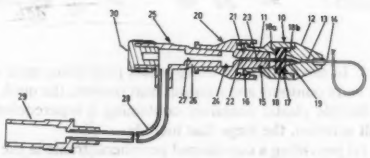
means while the other hand is inserting the needle in the aperature in the tubular covering for disposing the needle after use.

4,559,043

ASSEMBLY WITH SEPTUM FITTING FOR CONNECTING ADAPTOR AND FLUID TUBE

Craig M. Whitehouse; Daniel R. Snyder, both of Branford, Conn., and Ronald B. Luther, Newport Beach, Calif., assignors to DRS Infusion Systems, Inc., New Haven, Conn. and Luther Medical Products, Inc., Santa Ana, Calif.

Filed Oct. 29, 1984, Ser. No. 665,572
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—201 **19 Claims**



1. An assembly, including a septum fitting for a tube end, and comprising:

a. a distal end cap defining a central bore therethrough, and an enlarged bore entry;

b. a proximal connector connected with the distal end cap, a space being defined between the end cap and the proximal connector;

c. an external adaptor fitting having a septum piercing tube for fluid flow therethrough, a space being defined between the end cap and the proximal connector; and,

d. a septum disposed within the said space and adapted for compression between the proximal connector and distal end cap, the septum providing a self-sealing sterile, static barrier to a fluid being fed from the adaptor fitting through the septum piercing tube and the proximal connector, and then through the septum and into the bore entry;

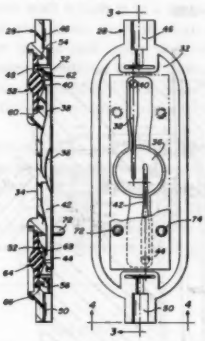
whereby, when the assembly is disconnected from the external adaptor, and the tube is removed, the septum maintains a self-sealing, sterile barrier to the bore entry and bore, and when the assembly is connected to the adaptor fitting, fluid flow may be resumed while maintaining the sterile, static seal peripherally of the septum and circumferentially along the tube.

4,559,044

VOLUMETRIC METERING UNIT FOR INTRAVENOUS FLUID ADDITION

Thomas P. Robinson, Plano; Don M. Killman, Balch Springs; Andrew P. Mattson, and James E. Hudson, Jr., both of Dallas, all of Tex., assignors to Quest Medical, Inc., Carrollton, Tex.

Filed Aug. 3, 1982, Ser. No. 404,811
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—246 **38 Claims**



1. A cassette for metering a fluid therethrough, comprising:

first and second integrally molded halves secured in facing relation, each of said halves being constructed to form: a reservoir portion; at least one inlet channel and at least one outlet channel each extending from the reservoir portion; and inlet and outlet port sections; the inlet channel and inlet port section of each being interconnected by an inlet orifice and the outlet channel and the outlet port section of each being interconnected by an outlet orifice, the reservoir portions of each half forming a reservoir and said port sections of each half forming a single entry port and a single exit port;

a flexible diaphragm means positioned between said first and second halves for dividing the reservoir into first and second compartments;

first entry valve means and first exit valve means associated with said first half, said first entry and exit valve means being movable between an open position permitting fluid flow through the inlet and outlet orifices of said first half, respectively, and a closed position to prevent flow through the inlet and outlet orifices, respectively;

second entry valve means and second exit valve means associated with said second half, said second entry and exit valve means being movable between an open position permitting fluid flow through the inlet and outlet orifices of said second half, respectively, and a closed position to prevent fluid flow through the inlet and outlet orifices, respectively;

fluid entering said entry port flowing through the inlet orifice and inlet channel of said first half into the first compartment when said first entry valve means and said second exit valve means are open and said first exit valve means and second entry valve means are closed, to move said diaphragm means to force the fluid in the second compartment through the outlet channel and outlet orifice of said second half to the exit port; and

fluid entering said entry port flowing through the inlet orifice and inlet channel of said second half into the second compartment when said second entry valve means and said first exit valve means are open and said first entry valve means and second exit valve means are closed, to move said diaphragm means to force the fluid in the first compartment through the outlet channel and outlet orifice

of said first half to the exit port, the fluid displaced from each of the first and second compartments having a predetermined volume.

4,559,045

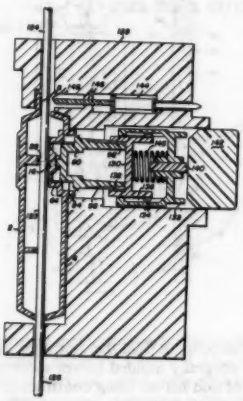
PINCH VALVE ASSEMBLY

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed May 10, 1983, Ser. No. 493,182

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—250 **7 Claims**



1. A disposable pinch valve assembly for a parenteral solution delivery system comprising a tubing receptor housing having mutually engagable front and back sections, the front section and back section thereof being hingedly connected along one edge and having an irreversible connecting means on the opposite edge thereof, the front section including a stationary pressure plate means against which tubing can be pressed, the back section including a movable pressure plate means for pressing tubing against said stationary pressure plate to reduce the cross-sectional area of the flow passageway of the tubing in response to axial displacement by a motor-driven actuator, wherein the irreversible connection means comprises a snap connection with a projection latch member and a receptor latch member, the projection latch member having a tooth defined by a sloped surface leading from the tip of the projecting latch member and a following surface which forms an acute angle with respect to the sloped surface, and the receptor latch member having a passageway for receiving the projecting latch member and a stop means which, by abutting the following surface of the projection latch member in latching engagement prevents withdrawal of the projecting latch member from the receptor latch member.

4,559,046

APPARATUS FOR INTRAVENOUS THERAPY AND HYPERALIMENTATION

LeRoy E. Groshong, and Ronald J. Brawn, both of Portland, Oreg., assignors to Catheter Technology Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 193,629, Oct. 3, 1980, Pat. No. 4,431,426, which is a division of Ser. No. 67,753, Aug. 20, 1979, Pat. No. 4,327,722. This application Jul. 28, 1983, Ser. No. 518,069

Int. Cl.⁴ A61M 25/00

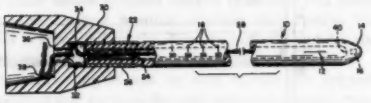
U.S. Cl. 604—282 **2 Claims**

1. In combination, a flexible catheter having a closed proximal end and an open distal end, and a stiffener to facilitate the insertion of said catheter into a body vessel,

said stiffener comprising a helically twisted, doubled flexible wire positioned with its doubled end adjacent the closed proximal end of the catheter,

said wire being twisted throughout its length,

the distal end of said stiffener extending to the distal end of said catheter, whereby force applied to said stiffener towards the



proximal end thereof will cause the proximal end of said stiffener to pull the proximal end of said catheter through a body vessel when the same are inserted therein,

said stiffener being unattached to said catheter whereby it may be withdrawn from the catheter after insertion of the catheter into a body vessel.

4,559,047

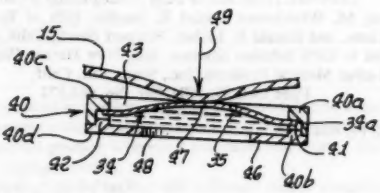
HEAT PRODUCING MASK AND METHOD OF USE

Imants P. Kapralis, 3020 S. Punta Del Este Dr., Hacienda Heights, Calif. 91745, and Harry Krukle, 7023 Bevis Ave., Van Nuys, Calif. 91405

Filed Jun. 4, 1984, Ser. No. 617,490

Int. Cl.⁴ A61F 7/00

U.S. Cl. 604—291 **31 Claims**



1. In the method of using a heat producing mask to closely fit body contours and transmit heat thereto, the mask including a flexible plastic container containing a supercooled aqueous salt solution, the steps that include:

(a) providing a cup-shaped peripheral frame in the container for peripherally supporting a trigger strip so that the center portion of the trigger strip is free to flex relative to the frame, and triggering the crystallization of said solution to initiate exothermic heat production, by transmitting force via the container to the trigger strip and to said frame thereby to flex the trigger strip relative to the frame,

(b) during said crystallization, preventing stiffening and maintaining flexibility, of said container and of the salt crystallizing therein, and

(c) applying the warm flexible container to a contoured body to locally heat the body by heat conduction thereto.

4,559,048

COUPLING FOR AN OSTOMY BAG

Peter L. Steer, Surrey, England, assignor to Craig Medical Products Limited, Sussex, England

Filed Jun. 25, 1984, Ser. No. 624,321

Claims priority, application United Kingdom, Jul. 1, 1983, 8317889

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—338 **14 Claims**

1. A coupling for joining a pad or dressing to an ostomy bag including first and second coupling elements each of closed loop form to define a stoma aperture therein, the first element being constructed so that it can be fixed to the pad or dressing

and the second element being constructed so that it can be fixed to one wall of an ostomy bag, in which the first element includes an inner wall which continuously encircles the aperature and a series of projecting members uniformly radially spaced from the inner wall and located in an array which surrounds the inner wall, and in which the second element includes a rib member encircling the aperture for making sealing engagement, when the coupling elements are joined,

with the outer surface of the inner wall, the coupling also having as a third element an annular ring which is constructed to be snap-fitted to the body side coupling element to extend radially outwardly therefrom whereby a wearer can place thumbs between the ring and body to support the first coupling element against the inwardly-directed force applied when coupling the first and second coupling elements together to attach the bag to the pad.

4,559,049

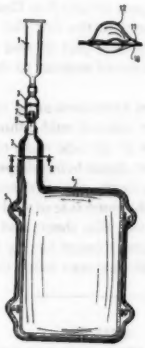
URINAL WITH A CHECK VALVE ON A FLACCID DRAIN LINE

Wilhelmus A. O. Haan, Bazuinlaan 7, 5402 PB Uden, Netherlands

Continuation of Ser. No. 268,982, May 8, 1981, abandoned. This application Nov. 23, 1984, Ser. No. 674,363

Int. Cl.⁴ A61F *5/44*

U.S. Cl. 604—350 **1 Claim**



1. A device for collecting urine from incontinent patients, comprising the combination of:

a first layer of flexible synthetic resin foil and a second layer of synthetic resin foil, said layers each having an enlarged portion and a narrow, neck-like portion projection therefrom, said layers being disposed in superimposed and generally registered relation;

means for joining said layers substantially circumferentially around said enlarged portions and along opposite sides of said narrow, neck-like portions to form a flexible receptacle for urine between said enlarged portions, to form a flexible duct means between said narrow, neck-like portions, to form an inlet mouth at the juncture of said flexible duct means and said flexible receptacle, and to form an inlet opening at that end of the duct means remote from said inlet mouth;

said flexible receptacle for urine being adapted to be affixed to a patient's leg;

said flexible duct means leading from said inlet opening to said inlet mouth, said duct means comprising an inner wall adapted to contact the patient's leg and an outer wall overlying said inner wall, said inner wall being adapted to contact the patient's leg and having a width less than the width of said outer wall which is in a flaccid, collapsed condition against said inner wall so that urine passes through the duct means said outer wall will flex outwardly to a transient condition out of contact with said inner wall from the collapsed condition to define a passage to allow urine to flow therethrough to the flexible receptacle;

a one way valve connected to that end of said duct means defining said inlet opening; and an external catheter for directing the patient's urine into said passage through said one way valve;

said one way valve being in fluid connection between said external catheter and said inlet opening of the duct means.

4,559,050

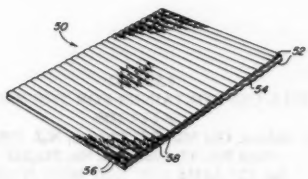
THIN, SOFT, ABSORBENT PRODUCT

Michael J. Iskra, Flemington, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Aug. 17, 1984, Ser. No. 641,545

Int. Cl.⁴ A61F *13/00*

U.S. Cl. 604—368 **10 Claims**



1. An absorbent structure comprising a fibrous web of resilient fibers, said web having a basis weight less than about 4 oz/sq. yd., an initial dry bulk of at least about 20 cc/gm., a dry bulk recovery of at least about 30 percent and a wet bulk of at least about 30 cc/gm., and superabsorbent disposed in amongst the fibers of said web in an amount of at least about 200 percent by weight based on said web weight, said structure having a Taber stiffness value less than about 50.

4,559,051

DISPOSABLE INCONTINENCE DIAPER

James P. Hanson, 8516 W. G Ave., Kalamazoo, Mich. 49009

Filed Jul. 18, 1983, Ser. No. 515,012

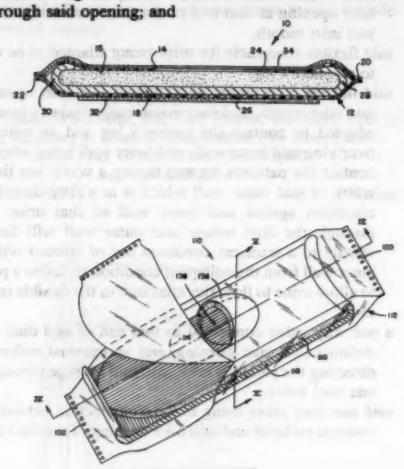
Int. Cl.⁴ A61F *13/16, 13/18*

U.S. Cl. 604—385 R **21 Claims**

1. An incontinence product for males comprising:

a flattened bag fabricated of a liquid impervious material, said bag including upper and lower opposite surfaces, said upper surface defining an opening positioned to be located proximate the perineal area of a wearer when said product is worn, said bag including a single integral flap extending across and arching above said opening for receiving the wearer's penis in a direction generally parallel to said

flattened bag to insure that voided urine is directed through said opening; and



filler material means within said bag for receiving urine through said opening.

4,559,052

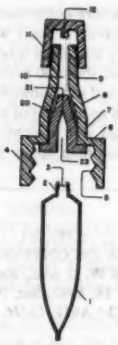
MULTIPLE USE CONTAINER FOR THE PACKAGING OF FLUIDS

Arthur L. Babson, Old Mill Rd., Chester, N.J. 07930

Filed Feb. 17, 1984, Ser. No. 581,313

Int. Cl.⁴ A61M *3/00, 5/00*; B65D *41/34*

U.S. Cl. 604—403 **7 Claims**



1. A multiple use container for blood gas control fluids comprising a gas impermeable collapsible tube; a blood gas control fluid within said tube; a cap adapted to fit over a neck portion of said tube; a unidirectional valve means positioned in said cap, said valve means being gas impermeable when closed; and said cap terminating in a leur tip.

4,559,053

BAGS FOR MEDICAL USE AND INTENDED IN PARTICULAR FOR PARENTERAL NUTRITION

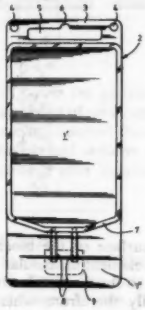
Etienne Porges, Neuilly, France, assignor to Synthelabo, Paris, France

Filed Aug. 12, 1983, Ser. No. 522,669

Claims priority, application France, Sep. 2, 1982, 82 15008

Int. Cl.⁴ A61M *5/00*; B65D *35/07*

U.S. Cl. 604—408 **18 Claims**



1. A bag for containing injectable products, comprising:

first and second sides each formed from a pliable film sheet, each of said film sheets comprisig at least one layer of plastic material;

a semi-rigid reinforcing frame formed from a plastic material, comprising side walls defining at least one central opening passing substantially perpendicular to a first plane passing perpendicular to the thickness of the frame and first and second flat faces surrounding said central opening, opposite each other with respect to said first plane;

said first and second film sheets each being shaped in the form of a flat bottomed dish having a surrounding film part which serves as a rim for the dish;

said surrounding film part of said first film sheet being fixed in a leak-proof manner to the first flat face of the frame and said surrounding film part of said second film sheet being fixed in a leak-proof manner to the second flat face of the frame;

connecting tube means communicating the exterior of the bag with the interior thereof, said connecting tube means passing through one of the side walls of the frame; and

the first and second film sheets being shaped and arranged so that when the bag is empty, said first and second sheets fit one in the other on the same side of said first plane so as to define between the two film sheets and within said opening of the frame a compartment having a volume which is variable and is practically zero when the bag is empty.

4,559,054

RATE-CONTROLLED DRUG RELEASE SYSTEM

Stephen D. Bruck, Rockville, Md., assignor to Research Corporation, New York, N.Y.

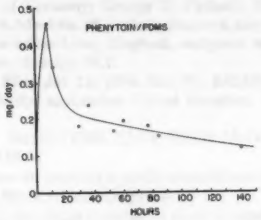
Filed Aug. 9, 1984, Ser. No. 639,277

Int. Cl.⁴ A61M *31/00*

U.S. Cl. 604—892 **16 Claims**

1. In a drug release device for the continuous and controlled administration of a drug over a prolonged period of time, said device comprising a reservoir containing the drug in a pharmaceutically acceptable carrier and a medically acceptable, outer polymeric membrane surrounding said reservoir, said polymeric membrane being formed of a drug release rate-controlling material which is permeable to the passage of said drug by diffusion, the improvement which comprises:

(a) forming said membrane from a block copolymer of poly(ether-urethane) and poly(dimethyl siloxane) and



(b) employing as the drug a lipophilic drug having a structural molecular weight below about 1000.

4,559,055

SELECTIVELY REMOVABLE PROSTHETIC NAIL

E. Olayinka Ogunro, 625 Ray Ave., DeSoto, Tex. 75115

Filed Apr. 13, 1984, Ser. No. 599,981

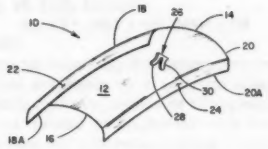
Int. Cl.[4] A61F 1/00

U.S. Cl. 623—11 **6 Claims**

1. A prosthetic nail adapted for use on one of the digits of a person's hand or foot, comprising the combination of:

(a) a nail plate comprising a sheet having front and rear ends and a longitudinal axis extending therebetween, and the plate being adapted to be placed on top of the distal end of a digit so that the longitudinal axis extends in the same general direction as to the distal phalangeal bone of the digit, and said plate being slightly curved as viewed in a transverse plane so as to approach the generally cylindrical cross-sectional shape of a typical digit, and said plate having a thin edge at its rear end that is adapted to be at least partially buried within the eponychial fold of the digit; and

(b) a bifurcated anchor member extending downwardly from near the front end of the nail plate, and said anchor member having two legs with proximal and distal portions, and the distal portions of the legs having a rest condition at which they are spaced apart appreciably further than are their proximal portions, and said distal portions being susceptible of being temporarily brought together so that the distal



portions are essentially as close as are the proximal portions, and the two legs lying in a transverse plane where they are exposed to being externally gripped from the front of the nail plate, whereby the nail plate is held in place on a digit when the leg distal portions are in their rest condition and when they are in contact with a pocket of tissue on the forward end of a person's digit, and whereby said leg distal portions may be temporarily brought together so that the anchor member may be lifted vertically away from the person's nail bed without damaging the pocket of tissue.

4,559,056

PROCESS FOR TREATING TEXTILE MATERIALS WITH SILICONE-CONTAINING COMPOSITION

Malcolm H. Leigh, Congleton, England; Hans Deiner, Neuss, Fed. Rep. of Germany; George C. Philpott, Wilmslow, England; Ian S. Macklin, High Peak, England, and Alan McDonald, Ashton-under-Lyne, England, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,468

Claims priority, application United Kingdom, Jul. 16, 1983, 8319300

Int. Cl.[4] C08L *83/04;* D06M *15/64*

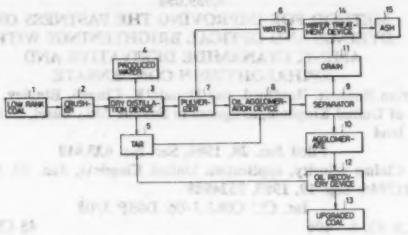
U.S. Cl. 8—115.64 19 Claims

1. A process for treating a textile material containing cotton or synthetic fibers which comprises

applying to the textile material an aqueous emulsion containing (a) an organopolysiloxane elastomer, (b) a crosslinking agent which is an organosiloxane-oxyalkylene copolymer wherein at least one silicon atom of an organosiloxane unit has attached thereto an oxyalkylene-containing group A having the formula

$$-X(OR)_nOSi(R')_a(OR'')_{2-a},$$
$$\quad\quad\quad

slurry by adding water to the finely pulverized coal, and then effecting oil agglomeration of the coal by adding a hydrocarbon fuel as a binder to said slurry thereby promoting separation of ash from the coal.

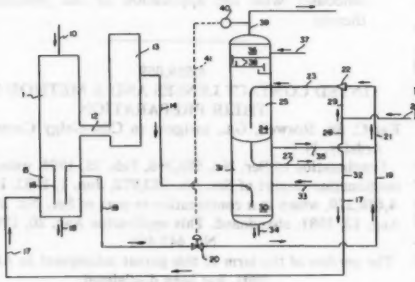


4,559,061

MEANS FOR SYNTHESIS GAS GENERATION WITH CONTROL OF RATIO OF STEAM TO DRY GAS

Frederick C. Jahnke, Rye; William B. Crouch, Chappaqua, both of N.Y., and George M. Gulko, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 510,488, Jul. 5, 1983, Pat. No. 4,502,869. This application Oct. 19, 1984, Ser. No. 662,661
Int. Cl.⁴ C10J *3/48, 3/84, 3/86*
U.S. Cl. 48—63 **2 Claims**



1. Apparatus which comprises

a gasification vessel wherein a carbon-containing fuel is partially oxidized in the presence of water and an oxygen-containing gas thereby forming a hot synthesis gas containing carbon monoxide and hydrogen;

an indirect heat exchanger wherein a first portion of said hot synthesis gas is cooled thereby forming a partially cooled first portion of said hot synthesis gas;

a quench chamber wherein a second portion of said hot synthesis gas is cooled thereby forming a quenched second portion of synthesis gas;

an upstanding attenuated scrubbing vessel;

a first scrubbing portion of said upstanding attenuated scrubbing vessel wherein a partially cooled first portion of hot synthesis gas from indirect heat exchange is scrubbed to form a further cooled portion of said hot synthesis gas;

a second scrubbing portion of said upstanding attenuated scrubbing vessel wherein said further cooled portion of said hot synthesis and said quenched second portion of synthesis gas from said quench operation are scrubbed to form a final product synthesis gas having a predetermined mole ratio of steam to dry gas;

means for measuring the temperature or flow of said final product synthesis gas exiting said second scrubbing portion of said upstanding attenuated scrubbing vessel and for generating a signal corresponding to said measurement; and

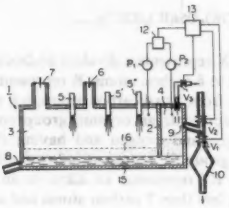
means for controlling the flow of said quenched second portion of said synthesis gas from said quench operation to said second scrubbing portion of said upstanding attenuated scrubbing vessel in accordance with said signal thereby maintaining a predetermined mole ratio of steam to dry gas in said final product synthesis gas.

4,559,062

APPARATUS FOR GASIFICATION OF SOLID CARBONACEOUS MATERIAL

Bunsho Hiraoka, Chiba; Tsutomu Tanaka, and Koji Okane, both of Ibaraki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,619
Int. Cl.⁴ C10J *3/48*
U.S. Cl. 48—92 **2 Claims**



1. A pressurized gasification apparatus of the closed type utilizing a high temperature molten metal bath, which comprises:

a gasification furnace of the closed type composed of a gasification chamber and a slag discharge chamber;

said gasification chamber being of the closed type, being provided with a product gas recovery port and at least one top-blowing lance, and maintaining said high temperature molten metal bath,

said slag discharge chamber being separated from said gasification chamber by a partition wall hung down from above and being in fluid communication with said gasification chamber,

said partition wall allowing a molten slag on said high temperature molten metal bath in said gasification chamber to flow into said slag discharge chamber;

a pressure controlling means for controlling the pressure of said slag discharge chamber so as to control the level of the molten slag in said slag discharge chamber,

said pressure controlling means comprising a valving means composed of a pressurizing valve and a reducing valve for pressure control of said slag discharge chamber, a pressure measuring means for said slag discharge chamber and said gasification chamber, a means for detecting the difference in pressure between said two chambers, and a means for controlling the pressure of said slag discharge chamber;

a means for discharging the molten slag from said slag discharge chamber when the level of the molten slag in said slag discharge chamber reaches a predetermined height; and

a slag collecting chamber of the closed type which separates and collects the slag discharged out of said slag discharge chamber, said slag collecting chamber being in fluid communication with said slag discharge chamber so that the molten slag in said slag discharge chamber may flow into said slag collecting chamber.

4,559,063

MULTI PURPOSE ON COLUMN INJECTION

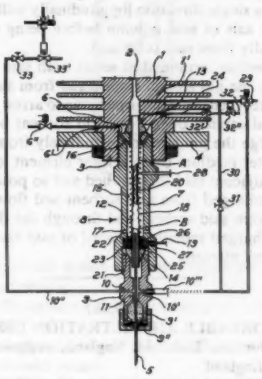
Fausto Munari; Giovanni Ostan; Carlo Saravalle, all of Milan; Bruno Tosi, Verano Brianza, all of Italy, and Sorin Trestianu, Brussels, assignors to Carlo Erba Strumentazione S.p.A., Rodano, Italy

Filed Sep. 7, 1984, Ser. No. 648,220

Claims priority, application Italy, Sep. 9, 1983, 22875/83[U]; Jun. 29, 1984, 22432/84[U]

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 55—67 23 Claims



1. A method of injecting a liquid sample into a gas chromatographic capillary column, comprising the steps of:

(a) injecting a liquid sample into the inlet of a vaporization tube, (b) passing a carrier gas into the outlet of the vaporization tube and volatilizing components of the liquid which are not desired to be submitted to the chromatographic analysis, and removing said carrier gas and said undesired components from a discharge conduit proximate the inlet of said vaporization tube, (c) heating the vaporization tube to volatilize the remaining liquid components and passing a carrier gas to the inlet of the vaporization tube to entrain the resultant vaporized liquid sample, and (d) passing resultant gas to a gas chromatographic column to conduct the gas chromatographic separation of the gaseous mixture.

8. A direct on column non-vaporizing injector for gas chromatographic analyzers, comprising an injector body, an accessory device for vaporization injections in the form of a tubular element having two ends and internal sidewalls, one end of said tubular element being fixable to the injector body coaxially to an injector passage adapted for the insertion of an injection syringe needle, the other end of said tubular element being closed by an insert provided with an axial hole and at least one other hole for vaporization sample splitting, a gas chromatographic capillary column being inserted and pneumatically sealed in said axial hole, heating means for heating a vaporization tube housed within said tubular element, said vaporization tube being connected to said injector passage for the injection syringe needle and to said holes of said insert, and receiving the upper end of the gas chromatographic column, said vaporization tube being provided with an inner section having a series of protrusions turned towards the axis of the tube and reciprocally offset and opposed for holding the injected sample in a liquid state.

4,559,064

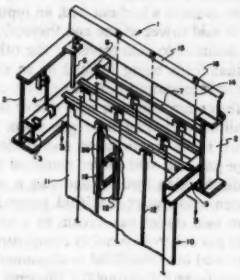
ELECTROSTATIC PRECIPITATOR HAVING SPACERS

Anthony J. Ahern, 717 Lucille Ave., SW., North Canton, Ohio 44720

Filed May 11, 1984, Ser. No. 609,330

Int. Cl.⁴ B03C *3/08, 3/86*

U.S. Cl. 55—145 18 Claims



1. An improved spacer for maintaining a pair of adjacent electrostatic precipitator plates in a horizontally spaced relationship, wherein each of said plates is of the type having a generally planar vertically extending surface spaced horizontally from and extending parallel with the planar surface of the adjacent plate, and in which a vertically extending rib is formed on each of the plates and projects perpendicularly from the planar surface inwardly toward the rib on the adjacent plate, said spacer including:

(a) rigid frame means having upper and lower cross members joined by at least one generally vertical extending member, said frame means being adapted to extend horizontally between a pair of the spaced ribs formed on the precipitator plates for maintaining the plates in a predetermined horizontal spaced relationship; and

(b) a pair of guide means formed on the frame means for slidably frictional clamping engagement with the spaced ribs for slidably vertically adjustably mounting said frame means on said ribs in a generally horizontally extending position between the horizontally spaced adjacent plates.

4,559,065

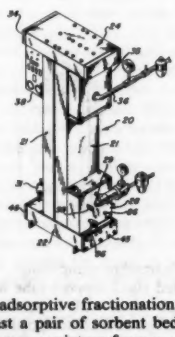
TWIN TOWER GAS FRACTIONATION APPARATUS

Robert A. Null; Lonnie C. Laughlin, both of Littleton, and Michael L. Goldberg, Breckenridge, all of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Filed Mar. 15, 1984, Ser. No. 590,013

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—161 5 Claims



1. In an apparatus for adsorptive fractionation of a gaseous mixture, including at least a pair of sorbent beds, means for directing a flow of the gaseous mixture from a source thereof

to one of the beds for removing a gaseous component of said mixture while simultaneously directing a flow of purge gas through the other of said beds for stripping the absorbed gas component therefrom, and means for controlling the flow of said gases to and from said beds, the improvement comprising, a generally elongated prism shaped tower of heat conductive material, means defining a pair of parallel bores extending axially longitudinally through said tower, said bores being adapted each to contain a sorbent bed, an input manifold sealingly secured to said tower at one end thereof, an output manifold sealingly secured to said tower at the other end thereof, each of said manifolds being formed as an elongated prism, means in each said manifold defining a pair of parallel bores each adapted for communication with one of said tower bores, said inlet manifold including inlet gas ports for receiving a gaseous mixture to be fractionated and outlet ports for discharging purge gas, and said outlet manifold including outlet gas ports for discharging fractionated gas, a restricted orifice opening between said outlet manifold bores for introducing purge gas from said outlet gas stream to a tower bore to be purged, an inlet gas control assembly comprising an inlet housing mounted on said inlet manifold in alignment with said inlet gas ports, means in said housing for filtering inlet gas to remove entrained solid and liquid particles therefrom, means for selectively opening and closing said inlet valve ports in response to a pressure differential in said inlet manifold bores, an outlet gas control assembly comprising an outlet housing mounted on said outlet manifold in alignment with said outlet gas ports, means in said housing for filtering said outlet gas to remove entrained solid sorbent particles therefrom, means for selectively opening and closing said outlet gas ports in response to a pressure differential in said outlet manifold bores, and a pair of pilot controlled valves mounted on said inlet manifold one in communication with each inlet manifold bore for controlling the flow of purge gas from a selected one of said inlet manifold bores, the opening of one of said purge valves and the concomitant closing of the other thereby effecting a flow of relatively higher pressure gas to be fractionated through the inlet manifold bore, tower bore and outlet manifold bore associated with the closed valve and a flow of relatively lower pressure purge gas through the bores operatively associated with the open valve.

4,559,066

FILTERS FOR PURIFICATION OF GASES

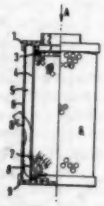
George S. Hunter, Richmond; Brian Walker, Washington, and Kenneth Merrie, High Shincliffe, all of England, assignors to Process Scientific Innovations Limited, Durham, England

Continuation of Ser. No. 442,060, Nov. 16, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 668,690

Claims priority, application United Kingdom, Nov. 16, 1981, 8134450; Oct. 28, 1982, 8230850

Int. Cl.[4] B01D *27/02*

U.S. Cl. 55—274 **8 Claims**



1. A filter cartridge comprising:

an elongated rigid support tube having a major portion of the length of its wall impervious to the passage of gas therethrough an a minor portion of the length of its wall extending from one end of said major portion and arranged for the discharge of gas peripherally around said tube from the inside to the outside thereof;

a pair of end closure members respectively applied to the ends of said support tube, the end closure member remote from said minor portion being formed with an inlet port;

a single bed of sorbent carbon material contained within said support tube and arranged for the removal of molecular size contamination from a gas stream when flowing from said inlet port, said bed completely extending over the full length of said support tube between locations substantially at said end closure members and consisting of one closely packed mass of material in the form of a column which consists of porous solids throughout the volume of said column, the flow of the gas stream from said inlet port taking place substantially through the whole length of said bed in a single direction longitudinally with respect to the central axis of said column before being discharged peripherally from said tube; and

a filter medium arranged in series with said sorbent bed to receive the gas stream discharged from said sorbent bed, said filter medium being operative to arrest any particulate material carried over from said sorbent bed and then to discharge the gas stream immediately from the cartridge, said filter medium being a filter element located immediately adjacent said sorbent bed and so positioned that the gas discharged from said sorbent bed flows radially outward from said sorbent bed through the filter element to be discharged radially outward of said cartridge through said filter element.

4,559,067

PORTABLE AIR FILTRATION DEVICE

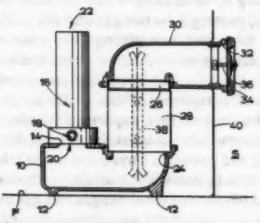
David S. Durston, Lichfield, England, assignor to Envirocor Limited, England

Filed Mar. 9, 1984, Ser. No. 588,044

Claims priority, application United Kingdom, Mar. 12, 1983, 8306853

Int. Cl.[4] B01D *46/02*

U.S. Cl. 55—324 **7 Claims**



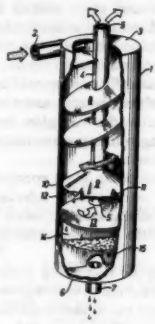
1. A portable air filtration device suitable for use in drawing off and cleaning contaminated air from a working space comprising a base defining an air passageway therein; an airmover mounted on top of one side of said base; said airmover having an air inlet in an underside thereof in communication with said base passageway, a second air inlet disposed transversely to said air inlet for coupling to a remote compressed air source, and an air outlet disposed above said air inlets for discharging filtered air to the atmosphere; filtering means mounted on top of said base on a side opposite said airmover; said filtering means having an air inlet side and an air outlet side; said filtering means outlet side being in communication with said base air passageway; an inlet duct in communication with said filter means inlet side; and fastening means for retaining said filtering means between said base and inlet duct, whereby in operation of the device with said inlet duct in communication with a working space said airmover draws contaminated air from the working space through said inlet duct, said filtering means and said base air passageway and exhausts cleaned air to atmosphere.

4,559,068

ARRANGEMENT FOR THE SEPARATION OF PARTICLES

Jan. E. R. Lagerstedt, Malmö, and Helge Andersson, Lund, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Aug. 15, 1984, Ser. No. 640,827
Claims priority, application Sweden, Aug. 25, 1983, 8304601
Int. Cl.[4] B01D 50/00
U.S. Cl. 55—399 12 Claims



1. An arrangement which separates liquid particles from a gas stream, comprising:

a substantially cylindrical vessel having an inlet end and a bottom end;

inlet means tangential of said inlet end for admitting said gas stream into said vessel;

a conduit extending into said vessel from said inlet end, said conduit having an open end defining an outlet internal of said vessel;

a guiding element extending helically from said inlet means downwardly about said conduit;

collar means for delimiting a gaplike passage along the wall of the vessel positioned between said guiding element and said outlet and spaced from said guiding element and said outlet, said guiding element guiding said gas stream obliquely downwardly toward said collar means so that the gas stream is rotated along an upper surface of said collar means.

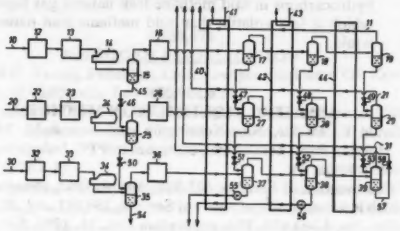
4,559,069

INTEGRATED FRACTIONAL CONDENSATION SYSTEM FOR THE PURIFICATION OF SEPARATE CRUDE GAS STREAMS

Hans Becker, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 555,908
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1982, 3244143
Int. Cl.[4] F25J 3/00
U.S. Cl. 62—11 15 Claims

1. In a process for the purification of a plurality of separate impure gaseous streams, each stream having a different total pressure and consisting of the same components, said process minimizing compression energy over combined processing facilities while maintaining a processing advantage over independent and distinct separation facilities by the steps comprising subjecting each of said gaseous streams to a separate multistage fractional condensation operation under the respective pressure of each stream; separating resulting condensates from each gaseous stream; expanding at least one condensate from a gaseous stream at a higher pressure to a lower pressure of another gaseous stream, and introducing resultant expanded fluid into said lower pressure gaseous stream, and subjecting



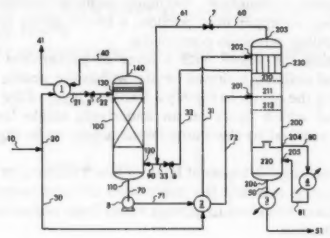
the resultant mixture of streams to at least one stage of at least one of said multistage fractional condensation operations.

4,559,070

PROCESS FOR DEVOLATILIZING NATURAL GAS LIQUIDS

Welby C. Sweet, Jackson, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 567,716, Jan. 3, 1984, Pat. No. 4,509,967. This application Jan. 17, 1985, Ser. No. 692,131
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.[4] F25J 3/02
U.S. Cl. 62—17 18 Claims



1. A process to devolatilize a natural gas liquid obtained from a natural gas feed comprised of methane, ethane and other heavier hydrocarbons, the process comprising the steps of:

(a) dividing said natural gas feed into a first stream and a second stream, the two streams having the same composition;

(b) reducing the temperature and pressure of said first and second streams such that each said stream has a distinct liquid phase and a distinct gas phase, said first stream has a temperature substantially lower than said second stream, and at least said first stream has a cryogenic temperature;

(c) feeding said first stream into the upper portion of a demethanizing absorption means and said second stream into the lower portion of said absorption means;

(d) recovering a methane-rich gas product from the top of said absorption means and a methane-lean natural gas liquid from the bottom of said absorption means;

(e) feeding said methane-lean natural gas liquid into a deethanizer means wherein an uncondensed vapor comprised of a portion of the ethane and substantially all of the methane in said methane-lean natural gas liquid is separated from said methane-lean natural gas liquid at a non-cryogenic temperature;

(f) recovering said uncondensed vapor from the top of said deethanizer means; and

(g) recovering a partially deethanized natural gas liquid product from the bottom of said deethanizer means comprised of the remaining portion of ethane and heavier hydrocarbons in said methane-lean natural gas liquid and which is less volatile than said methane-lean natural gas liquid.

4,559,071

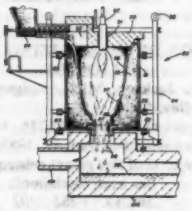
ABLATING LIQUEFACTION METHOD

Gerald E. Kunkle, New Kensington, and Joseph M. Matesa, Holiday Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 481,970, Apr. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 288,581, Jul. 30, 1981, Pat. No. 4,381,934. This application Oct. 16, 1984, Ser. No. 661,267

Int. Cl.[4] C03B *5/10*

U.S. Cl. 65—135 53 Claims



1. A method of liquefying thermally meltable material in a vessel having an upper inlet portion, a lower outlet portion, and surrounding sidewalls comprising:

(a) insulting the vessel with a layer of pulverulent batch material defining a sloped cavity within the vessel;

(b) heating the cavity to liquefy a transient layer of the batch material which flows on an underlying stable layer of batch material to the outlet immediately upon liquefaction;

(c) replenishing the transient layer of batch material at a rate sufficient to maintain the stable layer of batch material at a sufficient thickness to protect vessel from undue thermal deterioration.

4,559,072

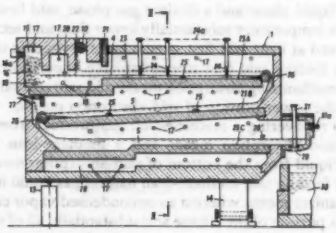
PROCESS AND APPARATUS FOR PRODUCING GLASS

Siegfried Harcuba, Innsbruck, Austria, assignor to Theodor P. Harcuba, Zurich, Switzerland and Interverre Anstalt, Vaduz, Liechtenstein

Filed Jun. 20, 1984, Ser. No. 622,700

Int. Cl.[4] C03B *3/00*

U.S. Cl. 65—136 27 Claims



1. Apparatus for producing glass comprising:

a furnace;

means for introducing a material selected from the group cullet and glass melt forming frit into the furnace at an upstream side and at a location upstream from a location at which a glass melt is formed in said furnace;

means for melting said material to form a flux upstream from said location at which said glass melt is formed;

a track along which said flux is continuously displaced;

means for guiding said flux along the track;

preheating means for preheating raw material components;

means for applying the preheated raw material components to the surface of the said flux at a location upstream of said location at which said glass melt is formed, said track being shallow and inclined and of a length having sufficient heating means to melt said raw material components before said raw material components reach said melt by entrainment with said flux along said track;

heating means for melting the raw material components so as to form with said flux the said glass melt; and

means for introducing refining materials into the furnace so as to refine the glass melt.

17. A process for producing glass comprising the steps of:

introducing at least one material selected from the group comprising cullet and glass-producing frit into a furnace and melting it therein to form a flux upstream of a glass melt;

continuously guiding the flux along a track to said melt;

applying preheated raw material components to the surface of the flux along said track, said track being shallow and of a length and with sufficient heating along its length to melt said raw material components before reaching said melt, said raw material components being substantially in the proportion of one part of flux to between one and nine parts of said preheated raw material components;

employing thermal energy to melt the raw material components so that the latter form with said flux a glass melt at a location along said track downstream from that to which said raw material components are applied to said flux; and

continuing to displace said glass melt along said track.

4,559,073

COMPOSTING EXCRETIONS FROM DOMESTIC ANIMALS

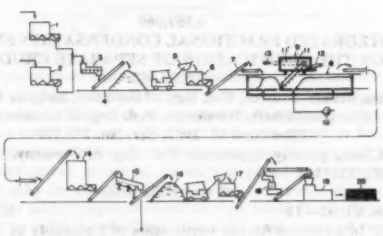
Hideo Minato, Suginami; Tadashi Fujisaki, Yono; Kazufusa Shimizu, Setagaya, and Yoshiharu Koyanagi, Yokohama, all of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 592,339

Claims priority, application Japan, Aug. 31, 1983, 58-159956

Int. Cl.[4] C05F *3/00, 11/02*

U.S. Cl. 71—9 12 Claims



1. A method of composting excretions from domestic animals, comprising the steps of:

(1) homogeneously mixing zeolite with excretions from domestic animals, the zeolite being about 10 to 30% by weight relative to a total weight of the excretions; the average water content of the mixture being above 55% by weight;

(2) piling and accumulating the mixture to naturally dry said mixture to produce a relatively low water content portion

on a surface of the piled mixture and a relatively high water content portion inside said low water content portion;

(3) maintaining the mixture piled until the water content of said low water content portion decreases to about 25% by weight or less, and an average water content of the entire mixture decreases to about 55% by weight or less;

(4) supplying the piled mixture into a fermentation vessel so as to avoid homogeneous mixing of said low water content portion with said high water content portion;

(5) scooping and turning over the mixture accumulated in the fermentation vessel such that said high water content mixture is divided into masses and said low water content portion is divided into fine powders so that said fine powders are spread around said masses, thereby preventing said masses from being bound each other; and

(6) subjecting said mixture in the fermentation vessel to an acrobic fermentation to thereby produce a compost.

4,559,074

WATER ABSORBING POLYMERS

John B. Clarke, Bradford, England, assignor to Allied Colloids Limited, England

Filed Aug. 5, 1983, Ser. No. 520,786

Claims priority, application United Kingdom, Aug. 17, 1982, 8223669; Mar. 21, 1983, 8307696

Int. Cl.⁴ C05F *11/02*

U.S. Cl. 71—24 **18 Claims**

1. A plant growth composition comprising a porous growth medium into which has been incorporated a particulate substantially non-ionic polyacrylamide containing 0 to 2% molar ionic groups, said polyacrylamide cross-linked by 30 to 100 ppm by weight polymer of cross-linking agent.

4,559,075

FERTILIZER PROCESSES AND COMPOSITIONS USING S-TRIAZINES

Donald E. Freepons, Kennewick, Wash., assignor to Melamine Chemicals, Inc., Donaldsonville, La.

Continuation of Ser. No. 305,394, Sep. 25, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,024

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.⁴ C05C *9/00*

U.S. Cl. 71—28 **6 Claims**

1. A process for furnishing a source of fertilizer nitrogen to field soil as a nutrient source for a crop by placing a granular fertilizer product, that in the soil is a source of nitrogen fertilizer values, on or in the soil at depths down to about 14 inches, comprising

applying to field soil granules of said product that are from 1 mm. to 10 mm. in size, said granules consisting of a mixture comprising

an amount of from 10% to 67% by weight of said granular product of discrete particles of a material selected from the group consisting of melamine, the mineral acid salts of melamine, and mixtures thereof, said particles having particle sizes not above 400 micrometers, and

an effective binding amount of from 33% to 90% by weight of a urea binder that binds said discrete particles in a form that is granular and that, after distribution of the granules in the soil, permits the action of water and microorganisms on said individual melamine particles,

said granules having been formed by heating a mixture of said particles and said urea binder in such a way as to permit the urea to solidify from the molten state so as to bind said particles in said urea,

said granules being suitable in granule strength and weight for mechanical dispensing and for application to or into the soil, the average crush strength of a sample of said granules, selected to have sizes of 3 mm. to 4 mm., being at least one pound per granule,

said particles being characterized by slow conversion in the soil to a form in which the nitrogen is useful to plant life growing in the soil.

4,559,076

NITROGEN FERTILIZATION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 396,739, Jul. 9, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,563

Int. Cl.⁴ C05B *15/00*

U.S. Cl. 71—29 **18 Claims**

1. A method for soil fertilization to reduce ammonia volatilization loss, which comprises the simultaneous application to soil of ammonic fertilizer and an additive selected from the group consisting of water soluble compounds of alkali metals, alkaline earth metals, and mixtures thereof, wherein the mole ratio of additive cation to ammonic nitrogen is greater than about 0.1.

4,559,077

AZOLYL-THIOETHER DERIVATIVES AS FUNGICIDES AND PLANT GROWTH REGULATORS

Erik Regel; Wilfried Draber, both of Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

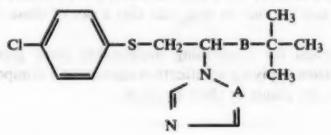
Filed Dec. 29, 1982, Ser. No. 454,303

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200414

Int. Cl.⁴ A01N *43/50, 43/64;* C07D *233/60, 249/08*

U.S. Cl. 71—76 **7 Claims**

1. An azolyl-thioether derivative of the formula



in which

A is a nitrogen atom or a CH group, and

B is a CO or CH(OH) group, or an addition product thereof with an acid or a metal salt.

4. A fungicidal or plant growth regulating composition, comprising a fungicidally or plant growth-regulating effective amount of a compound or addition product according to claim 1.

4,559,078

HERBICIDAL AND GROWTH REGULATOR PHOSPHORUS-CONTAINING N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS AND N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Ludwig Maier, Arlesheim; Willy Meyer, Riehen; Konrad Oertle, Therwil; Achim Roloff, Rheinfelden, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

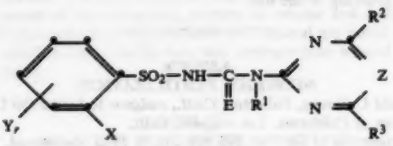
Filed Dec. 19, 1983, Ser. No. 562,659

Claims priority, application Switzerland, Dec. 27, 1982, 7562/82

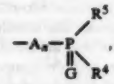
Int. Cl.⁴ A01N *57/24;* C07F *9/65*

U.S. Cl. 71—87 **16 Claims**

1. A phosphorus-containing N-phenylsulfonyl-N'-triazinylurea or N-phenylsulfonyl-N'-pyrimidinylurea of the formula



in which X is a group



Y is hydrogen, halogen, C_1–C_5-alkyl, trifluoromethyl, C_2–C_5-alkenyl, C_2–C_5-alkynyl, nitro, —COOR^6 or —Q—R^6, Z is nitrogen or the methine group, E is oxygen or sulfur, R^1 is hydrogen or C_1–C_5-alkyl and R^2 and R^3 independently of one another are C_1–C_3-alkyl, C_1–C_3-alkoxy, C_1–C_3-halogenoalkyl, C_1–C_3-halogenoalkoxy, cyclopropyl, amino, methylamino or dimethylamino, and A is oxygen, sulfur, C_1–C_5-alkylene, C_2–C_5-alkenylene, C_1–C_5-halogenoalkylene or —NR^7—$(CH_2)_m$—; —CH_2—NH—$(CH_2)_m$—; —$(CH_2)_m$—NR^7— or —O—$(CH_2)_p$—, —S—$(CH_2)_p$—, —$(CH_2)_p$—O— or —$(CH_2)_p$—S—, n is zero or one, G is oxygen or sulfur, R^4 is C_1–C_5-alkoxy, C_1–C_5-halogenoalkoxy, C_1–C_5-alkylthio, C_1–C_5-alkyl, C_1–C_5-halogenoalkyl, phenyl or hydroxyl, R^5 is hydrogen, C_1–C_5-alkoxy, C_1–C_5-halogenoalkoxy, C_1–C_5-alkylthio, C_1–C_5-alkyl or hydroxyl, R^6 is C_1–C_5-alkyl, C_1–C_5-halogenoalkyl or C_2–C_6-alkoxyalkyl, Q is oxygen, sulfur, —SO— or —SO_2—, R^7 is hydrogen, C_1–C_5-alkyl, phenyl, benzyl or phenyl which is substituted by C_1–C_5-alkyl, halogen or nitro, m is a number from zero to three, p is a number from zero to two and r is one or two, and also a salt of these compounds.

14. A method for controlling undesirable plant growth, which comprises applying an effective amount of a compound of claim 1 to the plants or their location.

4,559,079

SUBSTITUTED PHENYLSULFONYL GUANIDINE HERBICIDES AND INTERMEDITATES THEREFOR

Kozo Shiokawa, Kanagawa; Koichi Moriya, Tokyo; Toshio Goto, Kanagawa; Atsumi Kamochi, and Shigeo Kohama, both of Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

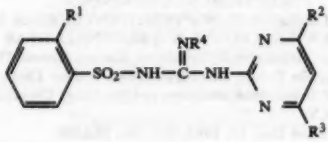
Filed Aug. 1, 1984, Ser. No. 636,521

Claims priority, application Japan, Aug. 10, 1983, 58-145157

Int. Cl.^{4} C07D *239/42, 239/47;* A01N *47/36*

U.S. Cl. 71—92 **9 Claims**

1. A substituted phenylsulfonyl guanidine of the formula



in which

R^1 is a phenyl or phenoxy group,

R^2 and R^3 each independently is a lower alkyl or lower alkoxy group, and

R^4 is a hydrogen atom, a lower alkyl group or a lower alkoxy group.

4,559,080

6-AMINO-2-ETHYLTHIO-4-PYRIMIDINOL AS A CITRUS RIPENER

Louis G. Nickell, Chicago, and Leonard J. Stach, Riverside, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 19, 1985, Ser. No. 703,075

Int. Cl.^{4} A01N *43/54*

U.S. Cl. 71—92 **11 Claims**

1. A method of lowering the acidity and increasing the Brix/acidity ratio of citrus which comprises applying to the citrus an effective amount of 6-amino-2-ethylthio-4-pyrimidinol or its water-soluble salt.

4,559,081

SULFAMOYL UREA DERIVATIVES

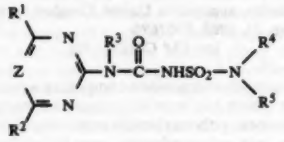
Barry Van Gemert, Massillon, Ohio, assignor to PPG Industries, Inc., Pittsburg, Pa.

Filed Dec. 3, 1984, Ser. No. 677,617

Int. Cl.^{4} C07D *407/12;* A01N *43/66*

U.S. Cl. 71—93 **5 Claims**

1. A compound represented by the formula:



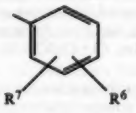
wherein:

Z is =N;

R^1 and R^2 are the same or different and represent halogen or C_1 to C_4 alkyl, or alkoxy;

R^3 and R^4 are the same or different and represent hydrogen, C_1 to C_4 alkyl, alkoxyalkyl, haloalkyl, or up to C_3 alkenyl or alkynyl;

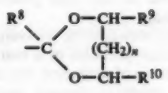
R^5 is



wherein:

R^6 is hydrogen or halogen;

R^7 is



wherein:

R^8 is hydrogen or C_1 to C_3 alkyl;

R^9 and R^{10} are hydrogen or C_1 to C_3 alkyl; and

n is 0, 1, or 2.

4,559,082

HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Raymond A. Felix, Richmond, and Joanna K. Hsu, Sunnyvale, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

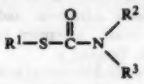
Filed Aug. 12, 1983, Ser. No. 522,931

Int. Cl.^{4} A01N *31/00, 37/00, 41/00*

U.S. Cl. 71—98 **13 Claims**

1. An herbicidal composition of extended soil life comprising

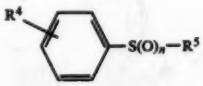
(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which

R^1, R^2 and R^3 are each independently C_2–C_4 alkyl; and

(b) an amount of an unsaturated aryl sulfide or sulfone having the formula



in which

R^4 is hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

R^5 is C_2–C_6 haloalkenyl or C_2–C_6 alkynyl; and

n=0 or 2;

sufficient to extend the soil life of said thiolcarbamate.

4,559,083

HERBICIDE COMPOSITION CONTAINING CARBOXYLIC-ACID-AMIDOTHIOLCARBAMATE DERIVATIVES

Károly Balogh; József Nagy; Zoltán Pintér, all of Miskolc; Csaba Tar, Kazincbarcika; István Tóth, Sajóbábony; Erzsébet Grega née Tóth, Miskolc; Zsolt Dombay, Miskolc; Károly Pásztor, Miskolc; Eszter Urszin née Simon, and László Tasi, both of Sajóbábony, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajóbábony, Hungary

Filed Sep. 22, 1982, Ser. No. 421,238

Claims priority, application Hungary, Sep. 29, 1981, 2794/81

Int. Cl.⁴ A01N *37/18;* **C07C** *155/02*

U.S. Cl. 71—100 **7 Claims**

1. A compound selected from the group consisting of

(a) N-methyl-N-(N'-ethyl-acet-anilido)-S-ethylthiolcarbamate;

(b) N-ethyl-N-(N'-methyl-acet-anilido)-S-ethylthiolcarbamate;

(c) N-ethyl-N-(N'-ethyl-acet-anilido)-S-ethylthiolcarbamate;

(d) N-allyl-N-(N'-ethyl-acet-anilido)-S-ethylthiolcarbamate;

(e) N-ethyl-N-(N'-methyl-acet-anilido)-S-n-propylthiolcarbamate; and

(f) N-ethyl-N-(N'-ethyl-acet-anilido)-S-n-propylthiolcarbamate.

4,559,084

SALT-COATED MAGNESIUM GRANULES

Edward J. Skach, Jr., Freeport, and George B. Cobel, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 267,124, May 26, 1981, Pat. No. 4,384,887, which is a continuation of Ser. No. 94,131, Nov. 14, 1979, Pat. No. 4,279,641, which is a continuation-in-part of Ser. No. 936,977, Aug. 25, 1978, Pat. No. 4,186,000. This application Mar. 3, 1983, Ser. No. 471,581

The portion of the term of this patent subsequent to Jan. 29, 1997, has been disclaimed.

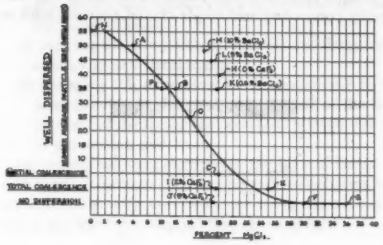
Int. Cl.⁴ C22C *1/04*

U.S. Cl. 75—0.5 B **20 Claims**

1. A process for producing salt-coated magnesium or magnesium alloy beads, said process comprising

stirring a mixture of molten magnesium or magnesium alloy and molten salt to cause dispersion of the magnesium or magnesium alloy as small beads in the molten salt and freezing the mixture to entrap the magnesium or magnesium alloy beads in a salt matrix,

wherein said magnesium or magnesium alloy comprises up to about 70% of the total weight of the mixture,



wherein said salt comprises NaCl mixed with a sufficient quantity of KCl, LiCl, $CaCl_2$ and/or $BaCl_2$ to give a mixture having a melting point below 650° C.,

but containing little or no CaF_2 or $MgCl_2$, said salt mixture having a freezing point lower than the freezing point of the magnesium or magnesium alloy.

4,559,085

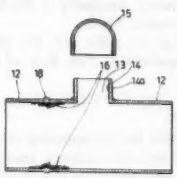
METHOD FOR REMOVING SPATTERS FROM A PIPELINE

Eddy Y. L. Liu, 83-4, Lin 13, Pin Yuan Li, Iong Hsiao Cheng Miaoli Hsien, and Pan F. Rong, 222, Hai-Pin Rd., Wu-Lu Li, Ching-Shui Cheng Taichung, both of Taiwan

Filed Jun. 18, 1984, Ser. No. 621,510

Int. Cl.⁴ B08B *9/00, 9/06*

U.S. Cl. 134—22.11 **2 Claims**



1. The process of installing a pipeline having a plurality of pipes welded together which includes, (a) utilizing pipes each of which has a handhole in its wall near one of its ends which is to be welded to the other, a projecting neck with external screw threads at each handhole and a cap with internal screw threads for each projecting neck, (b) after welding the pipes, removing through the handholes the spatters created in the pipeline due to the welding, (c) threadedly attaching the caps on the respective handholes after removal of the spatters, and (d) welding the ends of each cap around the periphery of the neck.

4,559,086

BACKSIDE GETTERING OF SILICON WAFERS UTILIZING SELECTIVELY ANNEALED SINGLE CRYSTAL SILICON PORTIONS DISPOSED BETWEEN AND EXTENDING INTO POLYSILICON PORTIONS

Gilbert A. Hawkins, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,849

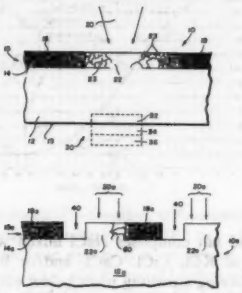
Int. Cl.⁴ H01L *21/263, 21/324*

U.S. Cl. 148—1.5 **4 Claims**

1. In a silicon wafer comprising a front side adapted to be made into one or more semiconductor devices, a backside, and

a layer of polysilicon in contact with at least a portion of said backside,

the improvement comprising spaced-apart portions of single crystal silicon dispersed between and extending into said polysilicon layer, and recrystallized crystal grains transitionally connecting said single crystal portions with portions of said polysilicon layer, said portions of single crystal silicon extending expitaxially from said silicon wafer, whereby said polysilicon portions contacting said single crystal portions act as gettering sites and said single crystal portions act as paths for impurities migrating to said gettering sites from said wafer.



4,559,087

PROCESS FOR PHOSPHATING METALS

Peter Jörns; Norbert Meyer; Werner Rausch; Josef Rothkegel; Gunther Luckhardt, and Gudrun Volling, all of Frankfurt, Fed. Rep. of Germany, assignors to Parker Chemical Company, Madison Heights, Mich.

Filed Apr. 17, 1984, Ser. No. 600,587

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315086

Int. Cl.⁴ C23F 7/12

U.S. Cl. 148—6.15 Z **1 Claim**

1. A process suitable for phosphating composite metal articles containing steel and zinc surfaces, using phosphating solutions based on zinc phosphate by the dipping process, which comprises (1) subjecting the composite metal article to a preliminary dipping in a zinc phosphate solution of not more than 30 seconds, (2) spraying the composite metal articles with a phosphating solution based on zinc phosphate while they are being conveyed from the preliminary dipping zone to the main dip-phosphating zone wherein the conveying time from the preliminary to the main dip-phosphating zone is limited to a maximum of 30 seconds, (3) subjecting the partially coated article to the main dip-phosphating in a zinc phosphate solution for a contact time between 1 and 10 minutes.

4,559,088

RUST PREVENTATIVES

Stanley C. Williamson, Burlington, Iowa, assignor to Amchem Products, Inc., Ambler, Pa.

Filed May 15, 1984, Ser. No. 610,535

Int. Cl.⁴ C23F 7/08

U.S. Cl. 148—6.15 R **9 Claims**

1. A process for inhibiting the formation of rust which comprises applying to an alloy containing iron a rust inhibiting quantity of a rust preventative compound selected from the mono-alkali and monoalkanolamine salts of phosphoric acid esters of unsaturated hydroxy fatty acids containing from 14 to 20 carbon atoms.

4,559,089

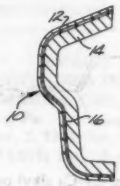
METHOD FOR MAKING A LIGHT WEIGHT COMPOSITE OF PURE ALUMINUM, HEAT TREATABLE ALUMINUM, AND STAINLESS STEEL

John A. Dromsky, North Attleboro, and Charles H. Zenuk, Rehoboth, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 83,920, Oct. 11, 1979, abandoned. This application Feb. 17, 1984, Ser. No. 581,488

Int. Cl.⁴ C21D 1/00

U.S. Cl. 148—11.5 Q **4 Claims**



1. A method for making strong, light weight composite material having improved formability characteristics comprising the steps of taking a relatively thin layer of commercially pure aluminum; a relatively thick layer of heat treatable aluminum and a relatively thin layer of stainless steel, annealing the stainless steel layer, advancing the layers into interfacial contact with one another with the heat treatable aluminum layer and the stainless steel layer sandwiching the commerically pure aluminum layer, squeezing the layers sufficiently to reduce their total thickness and form a composite having a metallurgical bond between contiguous layers, regulating the squeezing and advancing so that reduction in thickness of the layers occurs primarily in the heat treatable aluminum layer and the commercially pure aluminum to minimize work hardening of the stainless steel layer, sintering the composite to strengthen the metallurgical bond, annealing the commercially pure aluminum layer and the heat treatable aluminum layer to provide maximum formability of the composite, and forming the composite into a selected configuration thereby work hardening the stainless steel layer and thereafter heat treating the composite to develop the strength of the aluminum and maximize the yield strength of the composite.

4,559,090

USING A CORROSION PROOF AUSTENITIC IRON CHROMIUM NICKEL NITROGEN ALLOY FOR HIGH LOAD COMPONENTS

Günther Grützner, Krefeld, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,206

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3407307

Int. Cl.⁴ C21D 6/02, 7/02; C22C 38/48

U.S. Cl. 148—12 E **8 Claims**

1. The Method of making components of structural material expected to be exposed to corrosion mediums in combination with high mechanical loads comprising the steps of

providing an alloy consisting of not more than 0.12% C, from 0.075% to 0.55% N, not more than 0.75% niobium but not more than the 4-fold value of the nitrogen used in the alloy; from 16.0 to 32.0% Cr, from 7.0 to 55.0% Ni, not more than 8.5% Mn, not more than 6.5% molybdenum, not more than 3.0% silicon, not more than 4% copper, not more than 3,0% tungsten, the remainder being iron as well as unavoidable impurities (all percentages by weight);

heat treating the alloy at a high temperature for obtaining a relatively large amount of nitrogen to go into solution;

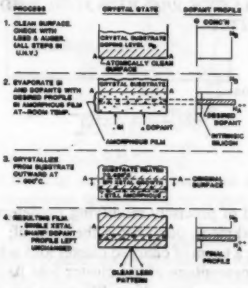
immediately cooling, subsequently cold working and recrystallization annealing the alloy so that precipations as well as an ultrafine grained structure with an average, linear intercept grain below 8.5 micrometers have formed so as to obtain a relatively high yield strength.

4,559,091

METHOD FOR PRODUCING HYPERABRUPT DOPING PROFILES IN SEMICONDUCTORS

Frederick G. Allen; Dwight C. Streit, both of Los Angeles, and Robert A. Metzger, Northridge, all of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Jun. 15, 1984, Ser. No. 620,917
Int. Cl.[4] H01L *21/365, 21/477*
U.S. Cl. 148—174 **11 Claims**



1. A method for producing arbitrary doping profiles in a semiconductor, comprising:

simultaneously depositing an amorphous layer of a semiconductor and a dopant onto an atomically clean semiconductor substrate; and

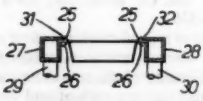
epitaxially crystallizing said amorphous layer to produce an epitaxial film on said substrate, with the doping profile of said epitaxial film being determined by the concentration of said dopant in said amorphous layer.

4,559,092

SEALING LIDS TO TRAY-LIKE CONTAINERS

John R. Oakley, Swindon, England, assignor to Metal Box Public Limited Company, Reading, England

PCT No. PCT/GB83/00123, § 371 Date Dec. 12, 1983, § 102(e) Date Dec. 12, 1983, PCT Pub. No. WO83/03807, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 26, 1983, Ser. No. 579,900
Claims priority, application United Kingdom, Apr. 30, 1982, 8212618
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—69 **10 Claims**



1. A method of sealing separate flat lids at margins thereof onto a series of generally rectangular tray-like containers having peripheral horizontal flanges, comprising the steps of:

(a) moving the containers along a line while positioning lids on the containers, with the margin of each lid located above the peripheral flange of a respective container,

(b) bending marginal side portions of the lid and/or side portions of the flange of the container so that, with the lid positioned over the container, a V-section is formed between the side portions of the lid and flange along each of opposed sides of the container parallel to the line of movement,

(c) providing a heat-activatable adhesive in said recesses,

(d) directing hot gas into the recesses to activate the adhesive within said recesses and to heat the side portions of the lid and flange,

(e) pressing the side portions of the lid and flange into mutual contact to seal them together,

(f) changing the movement of the containers so that what were previously marginal end portions of the lid and end portions of the flange are presented at each side of the line of movement, and

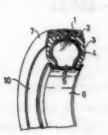
(g) sealing said end portions of the lid and flange together, said steps (a) through (g) being performed progressively and in serial relation with said container being moved continuously along the line from step (a) through step (g).

4,559,093

METHOD FOR RETREADING VEHICLE TIRES

Benny Berggren, Vällingby, and Ninneh Gripenholt, Lidköping, both of Sweden, assignors to Q&Q Retreading System AB, Lipköping, Sweden

Filed Dec. 27, 1982, Ser. No. 453,697
Claims priority, application Sweden, Jan. 20, 1982, 8200313
Int. Cl.[4] B29H *5/04*
U.S. Cl. 156—96 **6 Claims**



1. A method of retreading vehicle tires comprising the steps of providing an assembly comprising an unvulcanized tie-gum layer between a prevulcanized tire carcass and a prevulcanized tread, providing an electrically conductive reflector for microwaves in association with the tie-gum layer between the carcass and the tread, and locating a microwave applicator above the tread and emitting microwaves having an electrical field with tangential and radial components to the assembly, said reflector being of a width corresponding to the width of the tie-gum layer and arranged to short circuit the electric field component in the tangential direction of the assembly, so as to maximize the radially directed component of the electrical field to heat the tie-gum layer to vulcanization temperature substantially independent of the microwave properties of the tie-gum layer or carcass.

4,559,094

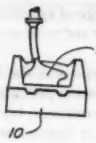
PROCESS FOR FORMING CUSHION ARTICLES

John E. Hostetler, Bettendorf; William H. Hulsebusch, Dewitt, and I. Weir Sears, Davenport, all of Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 572,068, Jan. 19, 1984, abandoned. This application Oct. 2, 1984, Ser. No. 655,917

Int. Cl.⁴ B29D *27/04*; D06M *1/00*

U.S. Cl. 156—212 **38 Claims**



21. A process for forming a cloth-covered cushion article, comprising the steps of:

constructing a foam cushion having the shape of the desired cushion article;

placing a cloth covering over the cushion, the covering being of unfinished cloth including heat fixable fibers;

heating the cloth covering while on the cushion to at least the heat-fixable fiber set temperature of the cloth covering so that the cloth will retain the three-dimensional shape of the cushion; and

cooling the cloth covering while on said cushion.

4,559,095

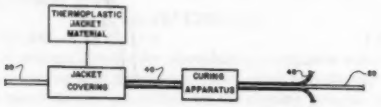
VULCANIZATION OF HOSE COMPOSITES PROTECTED WITH THERMOPLASTIC JACKETS

William R. Babbin, Barberton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 7, 1984, Ser. No. 618,177

Int. Cl.⁴ B32B *31/00*, *31/26*; F16L *11/00*

U.S. Cl. 156—244.13 **14 Claims**



1. A process for curing an elastomeric tubular article, comprising the steps of:

applying a recyclable thermoplastic jacket around the elastomer tubular article, said thermoplastic jacket being a material selected from the group consisting of polymethylpentane, high molecular weight polyethylene, fluoronated ethylene propylene copolymer, segmented polyesters, polyphenylsulfide, and a blend of a material having from about 25 to about 100 percent by weight of a thermoplastic polyolefin resin and from about 75 percent to about 0 or 1 percent by weight of a vulcanized monoolefin copolymer rubber based upon the total weight of said resin and said rubber, and from about 0 to about 300 parts by weight of oil based upon the total weight of said resin and said rubber, provided that when the amount of resin is greater than 75 percent by weight, said oil must be present in an amount sufficient to satisfy the equation $(W_o+W_r)/W_p$ is equal to or greater than 0.33 wherein W_o is the weight of oil, W_r is the weight of rubber, and W_p is the weight of resin, wherein said polyolefin resin is a polymer of one or more olefins having from 2 to 8 carbon atoms, and wherein said monoolefin copolymer rubber is a polymer made from two or more alpha monoolefins having the formula CH_2=CHR in which R is hydrogen or an alkyl of from about 1 to 12 carbon atoms, and from about 0 to about 10 percent by weight based upon the total weight of said alpha monoolefins of a diene having from 5 to 12 carbon atoms;

compacting and curing said elastomeric tubular article; and removing said thermoplastic jacket from said tubular article.

4,559,096

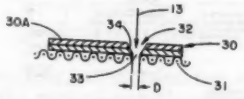
PRECISELY MODIFYING PREDETERMINED SURFACE LAYERS OF A WORKPIECE BY CLUSTER ION IMPACT THEREWITH

Lewis Friedman; Robert J. Buehler, both of Patchogue; Michael W. Matthew, East Patchogue, and Myron Ledbetter, Belle Terre, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 623,874

Int. Cl.⁴ B23K *9/00*; B32B *31/00*; B05D *3/06*

U.S. Cl. 156—272.2 **33 Claims**



1. A method of precisely modifying predetermined surface layers of a workpiece, comprising the steps of;

a. producing a beam of charged cluster ions wherein a predetermined percentage of the cluster ions have a mean size within the range from 25 to 10^6 atoms per cluster ion,

b. accelerating said beam of cluster ions with an electric field having an accelerating field gradient, thereby to impart a critical velocity of at least 10^6 centimeters per second to each of the cluster ions, and

c. impacting a selected area of a first outer surface layer of a workpiece with said accelerated beam of cluster ions at a preselected rate of impacts of cluster ions/cm^2/sec., thereby to effect a precise modification in the outer surface layers of the workpiece in said selected area, said precise modification comprising a predetermined alteration of the configuration of said outer surface layers of the workpiece in said selected area thereof.

4,559,097

METHOD OF BONDING USING A LIGNOSULFONATE-PHENOL-FORMALDEHYDE RESIN BINDER

Eugene R. Janiga, Roselle, Ill., assignor to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 427,841, Sep. 29, 1982, Pat. No. 4,423,173. This application Dec. 21, 1983, Ser. No. 564,236

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.⁴ B29J *5/02*; C09J *3/28*

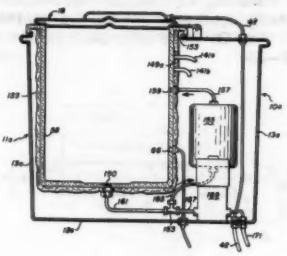
U.S. Cl. 156—335 **22 Claims**

1. A method of manufacturing a sheet material formed from a plurality of discrete members adhered together, including contacting a plurality of discrete sheet material members with a binding resin; disposing each of said sheet material members in contact with at least one other of said sheet material members and pressing said sheet material members together with sufficient heat and pressure to form a sheet material, the improvement comprising said binding resin, wherein said resin is formed by mixing phenol, formaldehyde, an alkali and a lignosulfonate consisting essentially of the lignosulfonates in a waste sulfite or sulfited cooking liquor as recovered from a pulping process to form a reaction mixture and heating said mixture to polymerize said mixture, said lignosulfonate being added to said reaction mixture before a substantial amount of reaction between said phenol and said formaldehyde.

4,559,098
NITRIDE ETCH BATH

Joseph V. Dunn, Santa Clara, Calif., assignor to Azonic Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 496,834, May 23, 1983, Pat. No. 4,475,977. This application Oct. 4, 1984, Ser. No. 658,262
Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—345 10 Claims



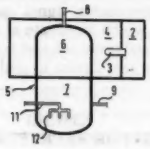
1. An improved acid bath comprising:
(a) an outer housing including a base and a plurality of sidewalls connected to said base to define an enclosure having an open top;
(b) an inner vessel for containing aqueous acid, said inner vessel having a bottom wall, a plurality of walls connected to said bottom wall to define a liquid-holding vessel having an open top, the inner vessel being sealingly mounted within the housing such that there is an enclosed space between the inner vessel and the walls of the outer housing;
(c) non-opaque sections formed in the walls of the inner vessel;
(d) liquid level sensor means including an infrared transmitter and receiver means located outside the outer housing, the level sensor means further including a first pair of light channel means optically connected to the transmitter and receiver means to extend therefrom into the outer housing;
(e) means fixedly mounting the terminal end faces of the light channel means to the non-opaque sections of the inner vessel, without penetrating the walls, for transmitting and receiving optical signals through said non-opaque sections, which signals are carried to the infrared transmitter and receiver means to indicate the presence, or absence, of liquid within the vessel at the level at which the terminal end faces of the light channel means are located.

4,559,099
ETCHING DEVICE

Gerhard Liebel, and Bert Kegel, both of Munich, Fed. Rep. of Germany, assignors to Technics GmbH Europa, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,709
Int. Cl.⁴ C23F 1/02; B44C 1/22; C03C 15/00
U.S. Cl. 156—345 9 Claims

1. Etching device comprising
a high frequency generator (2) having a radiator (3) and a resonator (4), where the said radiator (3) projects directly into the said resonator (4);
a reactor (5) having a plasma zone (6) and a processing zone (7) which open directly into each other, where one of these zones, the plasma zone (6), is surrounded by the said resonator (4) except the direct opening of the said plasma zone (6) into the said processing zone (7);

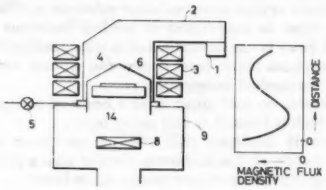


means (8) for introducing the gaseous plasma medium into the said reactor (5); and
means (9) for evacuating the said reactor (5).

4,559,100
MICROWAVE PLASMA ETCHING APPARATUS

Ken Ninomiya, Nakano; Shigeru Nishimatsu, Kokubunji; Keizo Suzuki, Hachioji; Sadayuki Okudaira, Ome, and Yoshifumi Ogawa, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,299
Claims priority, application Japan, Dec. 23, 1983, 58-241988
Int. Cl.⁴ H01L 21/306; C23F 1/03; B44C 1/22; C03C 15/00
U.S. Cl. 156—345 8 Claims

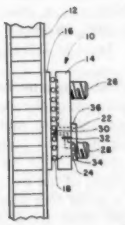


7. A microwave plasma etching apparatus comprising: a discharge tube into which a discharge gas is supplied and which forms a discharge region; means for generating a magnetic field in said discharge region; means for bringing a microwave into said discharge region; and a stage for holding a material in said discharge region.

4,559,101
MOUNTING DEVICE

Richard L. Long, Rowland Heights, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1983, Ser. No. 532,862
Int. Cl.⁴ B32B 31/26
U.S. Cl. 156—359 4 Claims



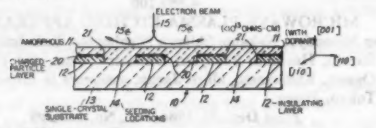
1. An apparatus for demountably mounting a device to a

brittle, lightweight structure which comprises a baseplate, at least one layer of a heat-activatable thermoplastic adhesive, electrical heater means affixed to said baseplate, electrical terminals at the ends of said heater means for applying electrical current, heat-sensing means in contact with said adhesive for providing a decodeable signal, said heat-sensing means having wire leads which terminate at terminals, a socket for housing said wire lead terminals and said heater terminals, and means for attaching said device to said baseplate.

4,559,102
METHOD FOR RECRYSTALLIZING A POLYCRYSTALLINE, AMORPHOUS OR SMALL GRAIN MATERIAL

Yoshinori Hayafuji, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 9, 1983, Ser. No. 493,025
Int. Cl.⁴ C30B *13/06*
U.S. Cl. 156—605 **15 Claims**



1. A method of recrystallizing a polycrystalline or amorphous upper layer extending over an electrically isolating layer on a single crystal semiconductor substrate in which said isolating layer is interrupted at seeding locations which are spaced apart in one direction and at which said polycrystalline or amorphous upper layer comes into contact with said substrate, the method comprising:

impacting on said upper layer a beam of charged particles which is focused at said upper layer;

relatively displacing said substrate and beam in said one direction so that said beam scans at least a portion of said polycrystalline or amorphous upper layer;

determining the speed with which said beam scans the upper layer so that the latter is subjected to zone melting when impacted by said beam for growing single crystals by lateral epitaxial recrystallization of said polycrystalline or amorphous upper layer from said seeding locations; and

avoding charge buildup on said isolating layer by providing said electrically isolating layer with a resistivity of less than 10^{13} ohms-cm.

4,559,103
PACKAGING PAPER AND PACKAGING MATERIAL FOR PACKAGING METALLIC MATERIAL AND METHOD OF PRODUCING THE SAME

Yoshika Nomura, Ichikawa; Susumu Sano, and Sadahiro Shoji, both of Tokyo, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 518,297
Claims priority, application Japan, Aug. 5, 1982, 57-135675; Aug. 5, 1982, 57-135676; Aug. 6, 1982, 57-136239; Aug. 16, 1982, 57-141079; Mar. 17, 1983, 58-45132
Int. Cl.⁴ D21H *5/22*
U.S. Cl. 162—160 **6 Claims**

1. A method for producing a packaging paper for packaging metallic materials comprising the steps of:

(A) pulping a lignocellulose material by a soda cooking liquor containing no sulfur comound having at least one quinone added thereto in an amount of 0.02 to 0.2 wt. % based on the weight of the oven-dry lignocellulose material to prepare a sulfur free pulp;

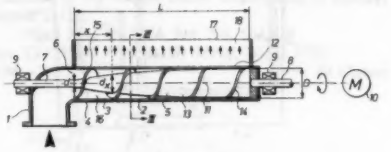
(B) making a paper sheet from said pulp in a neutral pH range between 6 and 8; and

(C) applying an agent having a rust-prevention effect to a surface of said paper sheet in an amount sufficient to prevent rusting of the metallic materials, said agent being selected from the group consisting of sodium benzoate, sodium nitrite, and sodium phosphate.

4,559,104
APPARATUS FOR DISCHARGING MATERIAL

Erik S. Eriksson, Karlstad, Sweden, assignor to KMW Aktiebolag, Karlstad, Sweden

Filed Aug. 27, 1984, Ser. No. 644,246
Claims priority, application Sweden, Sep. 16, 1983, 8304979
Int. Cl.⁴ D21F *1/02*; G01F *11/22*
U.S. Cl. 162—336 **13 Claims**



1. An apparatus for discharging material through an elongate aperture in a substantially constant amount per unit length of said aperture, comprising a screw discharging unit having an inlet end, a screw housing including a cylindrical casing wall, and a screw rotatably mounted in the screw housing, an elongate aperture provided in said cylindrical casing wall extending lengthwise a substantial distance along the length of said screw and substantially parallel to the axis of rotation of said screw, said screw having a core with a cross sectional area which increases in the direction of feed of the screw and at least one screw blade extending around the core and having a predetermined pitch for feeding the material from said inlet end to and along the length of said elongate aperture, and wherein said core and said casing wall define a space therebetween having an annular cross section area successively decreasing in the direction of feed of the screw.

13. A headbox for a paper machine for discharging papermaking stock through an elongate aperture to a nozzle in a substantially constant amount per unit length of said aperture, said headbox comprising a screw discharging unit having an inlet end, a screw housing including a cylindrical casing wall, a screw rotatably mounted in the screw housing, an elongate aperture provided in said cylindrical casing wall extending lengthwise, a substantial distance along the length of said screw substantially parallel to the axis of rotation of said screw, and a nozzle having a pair of opposing walls extending from said casing wall along the length of said aperture and defining a channel communicating with said aperture, said screw having a core with a cross sectional area which increases in the direction of feed of the screw, at least one screw blade extending around the core and having a predeterminded pitch for feeding the papermaking stock from said inlet end to and along the length of said elongate aperture, and wherein said core and said casing wall define a space therebetween having an annular cross section area successively decreasing in the direction of feed of the screw.

4,559,105
POSITIVE LOCK FOIL BLADES

Thomas Sennett, Beloit, Wis., and Jimmy L. Guetschow, South Beloit, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Jul. 5, 1984, Ser. No. 628,031
Int. Cl.⁴ D21F *1/54, 1/48*
U.S. Cl. 162—352 **1 Claim**

1. A positive locking foil blade mechanism for papermaking machine comprising in combination:

a foil having a substantially flat upper face arranged to diverge away from a traveling wire;

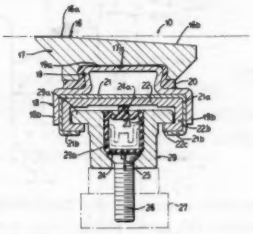
an upper holder for the foil with means attaching the foil to

the upper holder and movable toward and away from said wire;

an intermediate holder attached to the upper holder for co-movement therewith;

a lower holder attached to said intermediate holder for co-movement therewith and having downwardly extending sides and under-hanging flanges turning toward each other at the lower ends of the sides;

a fixed mount having laterally extending ribs respectively received inside said sides and underhanging flanges of said lower holder such that a bottom of said ribs engages said flanges in an operative position of the foil in contact with said wire;



means defining a single continuous channel extending longitudinally through the mount, said channel located intermediate said shoulders and flanges;

an inflatable element in said channel having an upwardly extending projection positioned for engagement with the lower holder upon inflation of said inflatable element for holding the flanges in engagement with the ribs and positively fixing the operating position of the foil, said projection withdrawing completely into said channel upon deflation of said inflatable element permitting said lower holder to rest substantially flush on said fixed mount with said bottoms of said ribs and said under-hanging flanges out of engagement;

and means for inflating and deflating the inflatable element.

4,559,106

PRESS ROLL AND PRESS IN A PAPER MAKING MACHINE

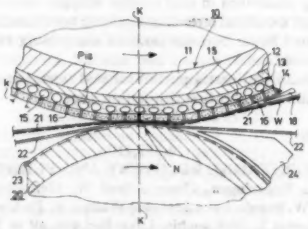
Osmo Skyttä, Jyväskylä, and Väinö Sailas, Vaajakoski, both of Finland, assignors to Valmet OY, Finland

Filed May 8, 1984, Ser. No. 608,231

Claims priority, application Finland, May 12, 1983, 831670

Int. Cl.[4] D21F *3/02, 3/08*

U.S. Cl. 162—358 **10 Claims**



1. In a paper making machine, a press roll adapted to form together with another roll a press nip having a press nip zone, comprising:

an inner frame having an outer substantially cylindrical surface; and

an elastic layered structure applied entirely around and adhering to said outer surface of said frame, said layered structure including an elastic inner layer having a plurality of cavities formed therein, and an outer layer having a plurality of discrete passages formed therethrough, at least one passage communicating with each of said cavities, the volume of a passage being smaller than the volume of a respective cavity with which it is in communication;

said cavities and passages being constructed such that during operation said cavities are compressed together within the press nip zone to thereby widen the press nip zone and such that said cavities produce a negative pressure in the press nip zone following a central region of the press nip zone.

4,559,107

METHOD FOR DRY COOLING COKE

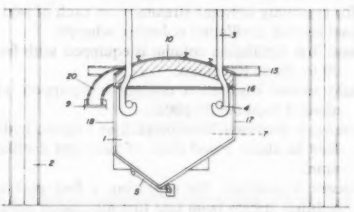
Kurt Lorenz, Hattingen; Engelbert Bruns, Recklinghausen, and Gerd Osterholt, Dorsten, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG., Recklinghausen, Fed. Rep. of Germany

Division of Ser. No. 465,254, Feb. 9, 1983. This application Apr. 18, 1984, Ser. No. 601,445

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206938

Int. Cl.[4] C10B *39/02*

U.S. Cl. 201—39 **5 Claims**



1. A method of dry cooling coke using a coke transporting bucket which comprises a container having a bottom with a discharge opening, a bottom flap for closing the discharge opening which is openable to release coke from the container and an open top with a container rim surrounding the open top, a cover having a cover rim engageable with the container rim for closing the container and sealing an interior of the container, the cover having an exhaust pipe terminating outside the cover in a downwardly extending exhaust connection, and an exhaust system with an upwardly open exhaust line in the cooling shaft, the method comprising:

transporting the bucket to a coke oven;

filling the bucket with red hot coke from the coke oven through the open top of the bucket;

transporting the bucket to the cooling shaft at a location under the cover;

lifting the bucket while it is filed with coke and positioned under the cover for bringing the cover rim into sealing engagement with the container rim;

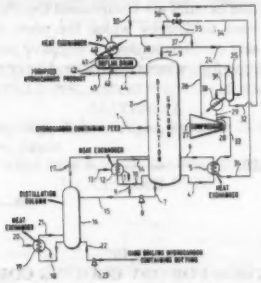
moving the bucket to a position in the cooling shaft for discharging the coke therein and for engaging the downwardly extending exhaust connection of the cover with the upwardly open exhaust line of the exhaust system; and opening the bottom flap of the bucket for discharging coke through the discharge opening of the bucket.

4,559,108

DISTILLATION APPARATUS

David T. Ahlberg, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Sep. 8, 1982, Ser. No. 416,001
Claims priority, application Canada, Oct. 30, 1981, 389083
Int. Cl.[4] B01D *3/14*
U.S. Cl. 202—154 3 Claims



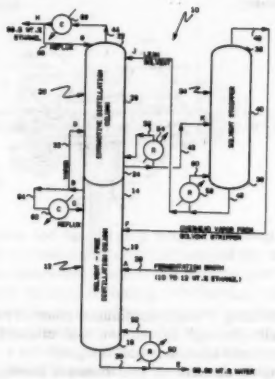
1. A distillation apparatus comprising in combination:
a first distillation column,
a second distillation column,
a compressor,
a first heat exchange means connected to said first distillation column at the bottom of said first distillation column,
a second heat exchange means connected to said second distillation column at the bottom of said second distillation column, and means for removing overhead streams and for removing bottoms streams from each of said first and said second distillation columns, wherein
said first distillation column is equipped with from about 70 to about 100 plates,
said second distillation column is equipped with from about 5 to about 20 plates,
means is provided for supplying an organic hydrocarbon feed to about a mid-point of said first distillation column,
means is provided for supplying a first portion of the bottoms stream from said first distillation column to an upper point of said second distillation column,
means is provided for circulating a second portion of the bottoms stream from said first distillation column to said first heat exchange means wherein it is subjected to indirect heat exchange with a stream from said compressor,
means is provided for circulating a bottoms stream from said second distillation column to said second heat ecxhange means wherein it is subjected to indirect heat exchange with a supply of hot water or steam,
means is provided for supplying an overhead stream from said second distillation column to a lower point of said first distillation column,
means is provided for removing a high boiling component stream from the bottom of said second distillation column,
means is provided for removing as purified product a portion of the overhead stream from said first distillation column,
means is provided for supplying a second portion of the overhead stream from said first distillation column to said compressor wherein said vapor is compressed and heated,
means is provided for circulating the heated compressed vapor stream from said compressor to said first heat exchange means wherein it is liquefied and cooled by indirect contact with said second portion of the bottoms stream and then to a point in the overhead stream from said first distillation column.

4,559,109

DEHYDRATION OF ALCOHOL WITH EXTRACTIVE DISTILLATION

Fu-Ming Lee, and Robert H. Pahl, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 31, 1983, Ser. No. 480,999
Int. Cl.[4] B01D *3/40*
U.S. Cl. 203—19 15 Claims



1. A process for dehydrating an aqueous feedstock comprising water and ethanol, comprising:
distilling said feedstock under distillation conditions in a first distillation zone to produce a first liquid bottoms product and a first vapor overhead stream comprising ethanol and water;
introducing at least a portion of said first vapor overhead stream into an extractive distillation zone;
contacting said thus introduced first vapor overhead with a selective solvent in said extractive distillation zone under extractive distillation conditions to thereby produce a second liquid bottoms product comprising water and said selective solvent and to thereby produce a second vapor overhead stream comprising greater than 95.57 weight percent ethanol based on the total weight of said second vapor overhead;
introducing at least a portion of said second liquid bottoms product comprising water and said selective solvent into a solvent stripper zone;
separating said second bottoms product under solvent stripping conditions in said solvent stripper zone into a third vapor overhead stream comprising water and ethanol and a third liquid bottoms product comprising said selective solvent; and
introducing at least a portion of said third vapor overhead stream into said first distillation zone.

4,559,110

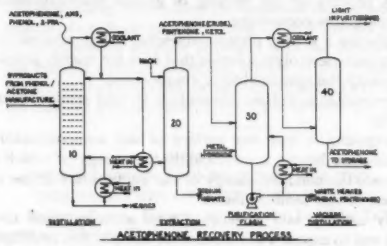
ACETOPHENONE RECOVERY AND PURIFICATION

Loren L. Swearingen, Clute; Alfred W. Heinsohn, Freeport; Craig W. Snook, Lake Jackson; Wallace E. Embrey, Freeport, and Garnet E. McConchie, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 11, 1983, Ser. No. 512,508
Int. Cl.[4] B01D *3/10*
U.S. Cl. 203—37 10 Claims

1. A process for recovering acetophenone from a phenolic heavies waste stream comprising the steps of (a) vacuum distilling said stream to recover overhead a distillate stream contain-

ing acetophenone, 2-phenyl propionaldehyde and phenol, (b) extracting said distillate stream with an aqueous solution of an alkali or alkaline earth metal hydroxide, having a concentration sufficient to provide an organic and an aqueous phase, to form sodium phenate and to substantially completely react 2-phenyl propionaldehyde with acetophenone to form a ketol addition product and at a temperature sufficient to dehydrate said addition product to form a diphenyl pentenone, (c) separating said aqueous phase which contains said phenol as sodium phenate from said organic phase, (d) distilling said organic phase in the presence of a catalytic amount of said metal hydroxide in order to dehydrate any remaining ketol addition product to form a diphenyl pentenone, (e) recovering said acetophenone overhead, leaving said pentenone as a bottoms product, and (f) further distilling said recovered acetophenone to remove lower boiling impurities to obtain a pure acetophenone.



ACETOPHENONE RECOVERY PROCESS

4,559,111

AZEOTROPIC PURIFICATION OF Z-11-HEXADECENAL

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1984, Ser. No. 684,208

Int. Cl.[4] B01D *3/36;* **C07C** *47/21*

U.S. Cl. 203—57 **19 Claims**

1. A process for the production of essentially pure Z-11-hexadecenal from a mixture comprising Z-11-hexadecenal, hexadecene, hexadecadiene and hexadecenol which comprises:

(a) azeotropically distilling said mixture in the presence of dimethyl sulfoxide (DMSO) at least until said hexadecene and hexadecadiene have been azeotropically distilled from said mixture; and

(b) azeotropically distilling the distillation bottoms from step (a) in the presence of a C_2–C_4 glycol.

4,559,112

ELECTRICALLY CONDUCTING POLYMER FILM AND METHOD OF MANUFACTURING THE SAME

Toshiaki Tamamura, Katsuta, and Osamu Niwa, Mito, both of Japan, assignors to Nippon Telegraph & Telephone, Tokyo, Japan

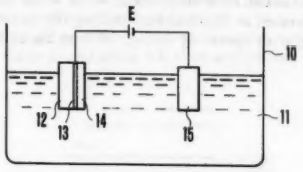
Filed Oct. 2, 1984, Ser. No. 657,314

Claims priority, application Japan, Oct. 7, 1983, 58-186991; Nov. 15, 1983, 58-213201; Nov. 15, 1983, 58-213203; Nov. 15, 1983, 58-213204; Feb. 24, 1984, 59-32595; Apr. 27, 1984, 59-84076; Jun. 4, 1984, 59-113099; Jun. 15, 1984, 59-121916; Jun. 29, 1984, 59-132905; Jul. 13, 1984, 59-144453

Int. Cl.[4] C25D *1/04;* **C25C** *3/00*

U.S. Cl. 204—12 **28 Claims**

1. A method of manufacturing an electrically conducting polymer film comprising the step of providing an insulating polymer film on the surface of an electrode; causing electrolyte solution and aromatic polymer to reach said electrode surface through said insulating polymer film; electrolytically polymerizing said aromatic polymer at the interface between said electrode and said insulating polymer film; and forming an electrically conducting aromatic compound area from said interface



of said insulating polymer film toward the inner side of the insulating polymer film.

4,559,113

METHOD AND APPARATUS FOR UNILATERAL ELECTROPLATING OF A MOVING METAL STRIP

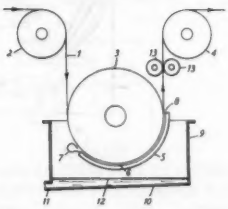
Isaïk Bus, Ijmuiden, and Joop N. Mooij, Castricum, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Mar. 16, 1984, Ser. No. 590,226

Claims priority, application Netherlands, Mar. 16, 1983, 8300946

Int. Cl.[4] C25D *5/02, 17/00*

U.S. Cl. 204—15 **5 Claims**



1. In a method of unilateral electroplating of a moving metal strip wherein the strip as the cathode is in contact with an electrically conductive peripheral surface of a rotating cathode roller within a container containing electrolyte and an anode concentric with the roller over a part of the roller circumference is located at a distance from the strip so as to form a slot into which electrolyte is supplied, the improvement comprising supplying the electrolyte only at the entrance end of said slot in the direction of strip movement and spaced above electrolyte contained in said container so that the electrolyte flows turbulently and generally unidirectionally through a 12 mm slot to the exit end thereof and at a rate such that the average velocity of the electrolyte through the slot is at least 75% of the linear strip velocity and prevents formation of the boundary layer on the anode thereby reducing the voltage across the cell.

4,559,114

NICKEL SULFATE COLORING PROCESS FOR ANODIZED ALUMINUM

Bernard R. Baker, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 13, 1984, Ser. No. 670,851

Int. Cl.[4] C25C *11/22*

U.S. Cl. 204—37.6 **7 Claims**

1. A method of coloring an anodized aluminum-based metal workpiece comprising passing an alternating current through an aqueous acidic nickel sulfate electrolyte between said workpiece and a counter electrode, both of which are submerged

therein, maintaining the electrolyte at a temperature during the coloring within the range from about 30° C. to about 80° C., at a pH within the range from about 2.0 to about 5.5 at a nickel sulfate concentration from about 40 to about 100 grams per liter expressed as Nig/e and controlling the current during the coloring at an operating voltage of from about 5 to about 40 volts.

4,559,115

METHOD OF AND APPARATUS FOR MACHINING CERAMIC MATERIALS

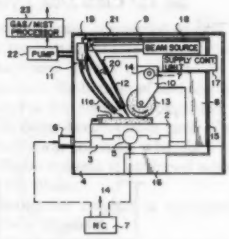
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Filed May 30, 1984, Ser. No. 615,416

Claims priority, application Japan, May 30, 1983, 58-96727; May 31, 1983, 58-97586

Int. Cl.⁴ B23P *1/04, 1/06, 1/10;* **C25F** *3/14*

U.S. Cl. 204—129.1 **21 Claims**



1. A method of machining a workpiece of a ceramic material, comprising the steps of:

bringing into contact with the workpiece a liquid electrolyte having at least one component which is chemically reactive with the ceramic material at an elevated temperature;

applying to a limited zone of interface between said liquid electrolyte and said workpiece, localized energy of a magnitude sufficient to heat said liquid electrolyte and said material at said limited zone to said elevated temperature and to remove from the workpiece the locally heated material at said limited zone in a form at least partially chemically degenerated with said at least one component; and

displacing, in a scanning manner, said limited zone acquiring said localized energy from one region to another on said workpiece along a programmed continuous path to continuously remove said material along said path from the workpiece,

said localized energy being applied by irradiating said limited zone with an energy beam, said zone being displaced along said path by relatively displacing said energy beam and said workpiece along said programmed path, a portion of said localized energy being applied to said limited zone by disposing a pair of electrodes closely spaced apart from each other adjacent to said limited zone and effecting a succession of electrical discharges through said liquid electrolyte across said electrodes, said electrodes and said workpiece being also relatively displaced in a said scanning manner to displace said limited zone from one region to another on the workpiece along said programmed path.

4,559,116

PROCESS OF ETCHING SEMICONDUCTOR ELECTRODES

Arthur B. Ellis, and Michael K. Carpenter, both of Madison, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 9, 1984, Ser. No. 628,825

Int. Cl.⁴ C25F *3/12*

U.S. Cl. 204—129.3 **19 Claims**

1. A process for the etching of graded photoluminescent semiconductors comprising

A. placing a graded photoluminescent semiconductor in an etchant electrolyte solution that does not readily attack or modify the semiconductor composition,

B. providing a voltaic connection to said semiconductor, and

C. exposing at least one surface of said semiconductor to radiation having a wavelength, the energy of which exceeds the bandgap energy of the composition at the surface of said semiconductor

thereby causing said surface of said semiconductor to be etched and to expose a semiconductor composition of differing chemical composition than that of the original surface of the semiconductor.

4,559,117

BLOCK COPOLYMERS MADE BY RADIATION CROSSLINKING OF MISCIBLE MIXTURE OF HOMOPOLYMERS

Georg G. A. Bohm, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 12, 1982, Ser. No. 441,202

Int. Cl.⁴ C08J *3/24, 3/28;* **C08L** *9/00, 53/00*

U.S. Cl. 204—159.13 **16 Claims**

1. A process for producing substantial crosslinking between two or more polymer components comprising the steps of preparing a miscible mixture of said polymer components, said mixture being completely homogeneous and comprising at least 20 percent by weight each of at least two said polymer components based on the combined weight of said polymer components and thereafter irradiating said mixture while still maintained in a miscible condition with a high energy electron source generating at least about 10,000 electron volts until a dose of at least 0.1 megarad has been absorbed, said polymer components each having a group therein capable of generating free radicals upon irradiation, in which process initially prepared highly crosslinked product is either removed or partially degraded during radiation of less highly crosslinked portions of said mixture.

4,559,118

MAGNETIC RECORDING MEDIA

Guenter Heil, Ludwigshafen; Herbert Spoor, Limburgerhof; Werner Lenz, Bad Duerkheim; Jenoe Kovacs, Hessheim; Werner Grau, Bobenheim-Roxheim; Werner Balz, Limburgerhof, and August Lehner, Roedersheim-Gronau, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,936

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332503

Int. Cl.⁴ C08F *2/46*

U.S. Cl. 204—159.14 **1 Claim**

1. A magnetic recording medium which comprises a non-magnetic base and one or more magnetic layers consisting of an organic binder matrix containing finely divided magnetic material, the said matrix being obtained by electron beam curing of a mixture of from 50 to 100% by weight of a polyurethane acrylate polymer possessing polymerizable double bonds and from 0 to 50% by weight of an acrylate and/or an acrylate prepolymer and/or an N-vinyl monomer and/or an N-vinyl

prepolymer, wherein the polyurethane acrylate polymer is composed of

(1) one or more diisocyanates,

(2) one or more oligomeric or polymeric diols,

(3) one or more low molecular weight diols, and

(4) one or more monohydroxyalkyl acrylates,

and the amount of NCO groups of the diisocyanate is from 95 to 105% of the number of equivalents of OH groups of components 2, 3, and 4 and the molar amounts of the OH-containing components are chosen so that the concentration of urethane groups is from 2.7 to 4.2 moles per kg of polyurethane acrylate polymer, with the proviso that the number average molecular weight of the polymer is from 1,000 to 10,000 and the ratio of the weight average to the number average molecular weight is from 2.2 to 3.5.

4,559,119

INSTALLATION AND PROCESS FOR THE PREPARATION OF ACID CASEINATES

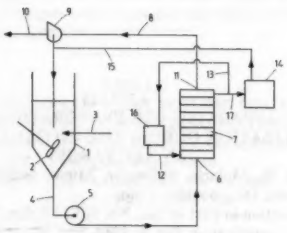
René Bolzer, Brece, France, assignor to Laiterie Triballat, Noyal sur Vilaine, France

Continuation of Ser. No. 559,420, Dec. 8, 1983, abandoned. This application Mar. 6, 1985, Ser. No. 709,341

Claims priority, application France, Dec. 15, 1982, 82 21035

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—182.6 **4 Claims**



1. A process for the preparation of an acid caseinate having a pH below approximately 2.5 which comprises circulating an acid caseinate having a pH below 2.5 in a closed circuit successively incorporating a container without intervening separating means, a pipe passing from the container outlet directley to the inlet of an electrodialyzer, the electrodialyzer and a pipe passing from the electrodialyzer outlet to the inlet of the container, removing a fraction of the acid caseinate in that part of the circuit passing from the electrodialyzer outlet to the container outlet and feeding milk into the circuit in that part of the circuit passing between the container inlet and the electrodialyzer inlet.

4,559,120

AGAROSE GEL ELECTROPHORESIS TECHNIQUE FOR THE DETERMINATION OF AMYLASE ISOENZYMES

Vicki L. Royse, Elmhurst, and Donald M. Jensen, Oak Park, both of Ill., assignors to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed Mar. 23, 1983, Ser. No. 478,506

Int. Cl.⁴ G01N *27/26;* **B01D** *15/08*

U.S. Cl. 204—182.8 **14 Claims**

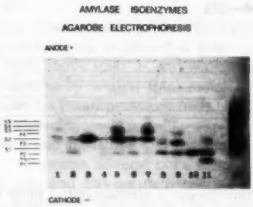
1. An electrophoretic method of detecing human isoamylases comprising

providing an aqueous buffer having a pH of between about 8.4 and about 9.2, said buffer consisting essentially of water, barbital anion at a concentration of between about 0.04 M and about 0.08 M, tris cation at a concentration of between about 0.03 M and about 0.07 M, sodium cation at a concentration of between about 0.03 M and about 0.07 M, said tris cation and said sodium cation being present in molar ratios of between about 0.5:1 and about 2:1,

incorporating said buffer in an agarose gel of between about 0.4 and about 1.5 weight percent agarose,

applying biological samples to said gel,

subjecting said gel to a direct current electrical potential of between about 50 and about 400 volts and placing said gel



in heat exchange relationship with a cooling block maintained at a temperature of between about 2° C. and about 25° C. so as not to denature the isoamylases or destabilize the gel, and

developing said gel to reveal isoamylase bands,

said method providing a clear separation of P_1, P_{1b}, P_2, P_3, P_4, S_1, S_2, S_3, S_4 and S_5 bands.

4,559,121

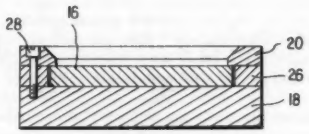
METHOD AND APPARATUS FOR EVAPORATION ARC STABILIZATION FOR PERMEABLE TARGETS

William M. Mularie, Stillwater, Minn., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Sep. 12, 1983, Ser. No. 531,287

Int. Cl.⁴ C23C *15/00*

U.S. Cl. 204—192 R **28 Claims**



17. A method of evaporation arc stabilization comprising the steps of

establishing an arc on a surface of a permeable target to evaporate the target, the arc being characterized by the presence of charged particles and a cathode spot which randomly migrates over said target surface;

confining the arc to the target surface with a confinement ring which contacts and surrounds the target surface, the ring being composed of a material having (a) a secondary emission ratio less than one at the mean energies of the charged particles of the arc and (b) a surface energy less than that of the evaporated target material; and

surrounding the target with a permeable ring to thereby effect substantially uniform evaporation of the target material from the target surface.

4,559,122

CONTINUOUS-CYCLE ELECTROPLATING PLANT

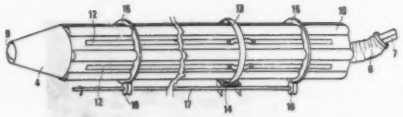
Luciano Folco, Via Cal de Guà 5, Montecchio Maggiore (Province of Vicenza), and Cirillo S. Reniero, Arbizzano, both of Italy, assignors to Luciano Folco, Montecchio Maggiore, Italy

Filed Oct. 29, 1984, Ser. No. 665,835

Claims priority, application Italy, Nov. 7, 1983, 84974 A/83; Nov. 7, 1983, 84975 A/83

Int. Cl.[4] C25D *17/20*

U.S. Cl. 204—201 3 Claims



1. A continuous-cycle electroplating plant for plating loose metal items, the plant including a d.c. current supply and at least one processing unit comprising

a barrel mounted for rotation on support structure,

a spiral rigid with, and extending along and around, the inner sidewall of the barrel, thereby acting, in use, as a spiral conveyor for moving the metal items from an inlet end of the barrel to its outlet end,

a plurality of longitudinal peripheral seats in communication with the barrel interior,

pieces or rods of a plating metal accommodated in said seats and in electric contact with one pole of the said current supply, and

a liquid electrolyte contained in the said barrel and in electric contact with the other pole of the said current supply.

4,559,123

DEVICE FOR ELECTROLYTICALLY DEPOSITING A LINING METAL LAYER OVER A METAL STRIP

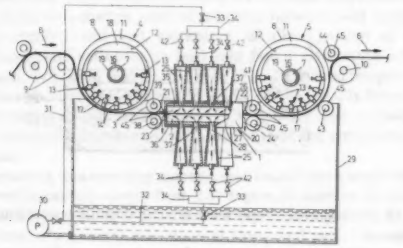
Jean-Pierre Moore, Watermael-Boitsfort; René Winand, Rixensart; Alain Weymeersch, Montegnée, and Lucien Renard, Seraing, all of Belgium, assignors to "Cockerill-Sambre" , Seraing, Belgium

Filed Nov. 9, 1984, Ser. No. 669,829

Claims priority, application Luxembourg, Nov. 11, 1983, 85086

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—206 14 Claims



1. Device for electrolytically depositing, in a continuous operation and under a high current density, a lining metal over at least the one surface of a metal strip moving through an electrolytic bath, comprising at least one conducting roller cooperating with a cathode current supply, extending crosswise relative to the strip movement direction and rotating about the axis thereof, in contact with the strip, substantially at the same circumferential speed as the traversing speed thereof, at least one anode being provided in the electrolytic bath facing at least the one surface of the strip moving through said bath, device in which said conducting roller is at least partly hollow, and the cathode current supply comprises a series of parallelconnected contacts which are mounted on at least one fixed support and are distributed over the inner cylinder-like surface of the roller which lies opposite that outer surface portion the strip is applied on and which is eccentric relative to the outer cylinderlike surface thereof, the curvature center thereof lying on the roller revolution axis .

4,559,124

NICKEL OXIDE BASED DIAPHRAGM

Jiri Divisek, and Peter Malinowski, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,877

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318758

Int. Cl.[4] C25B *13/00*

U.S. Cl. 204—295 4 Claims

1. A nickel oxide-based diaphragm for use in alkaline water electrolysis, said diaphragm having a structural metallic frame with a porous nickel oxide layer having a titanium oxide content of between about 1 to 20% by weight of the oxide mass.

4,559,125

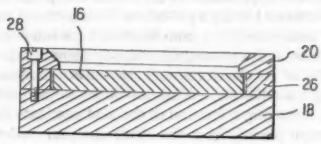
APPARATUS FOR EVAPORATION ARC STABILIZATION DURING THE INITIAL CLEAN-UP OF AN ARC TARGET

William M. Mularie, Stillwater, Minn., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 531,287, Sep. 12, 1983. This application Jan. 6, 1984, Ser. No. 639,907

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—298 15 Claims



1. Apparatus for evaporation arc stabilization comprising:

a target having a surface of non-permeable material to be evaporated;

means for evaporating the target material by establishing an arc on the target surface, the arc being characterized by the presence of charged particles and a cathode spot which randomly migrates over said target surface;

a confinement ring contacting the target and surrounding the target surface, the ring being composed of a material having (a) a secondary emission ratio less than one at the mean energies of the charged particles of the arc and (b) a surface energy less than that of the evaporated target matrial to thereby confine the cathode spot to the target surface; and

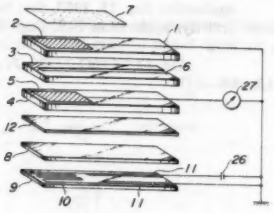
a permeable ring surrounding said target for retaining the cathode spot on the target surface, said confinement ring covering said permeable ring so that, at least during the initial clean-up of contaminants from the target the cathode spot will not move onto the permeable ring.

4,559,126

ELECTROCHEMICAL DEVICE

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 30, 1984, Ser. No. 635,739
Claims priority, application Japan, Aug. 9, 1983, 58-144475
Int. Cl.[4] G01N 27/56
U.S. Cl. 204—425 23 Claims



1. An electrochemical device, comprising an electrochemical cell having at least one pair of electrodes disposed in contact with a solid electrolyte, a heater layer having a heater embedded in a ceramic layer having substantially the same coefficient of thermal expansion as that of said solid electrolyte, and a high electric resistance ceramic layer spread substantially over an entire span between said electrochemical cell and said heater layer.

4,559,127

CONVERSION OF HIGH BOILING ORGANIC MATERIALS TO LOW BOILING MATERIALS

Stephen C. Paspek, Jr., North Royalton, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed May 24, 1984, Ser. No. 613,880
Int. Cl.[4] C10G 1/04, 11/08
U.S. Cl. 208—8 LE 23 Claims

1. A process for the conversion of high boiling organic materials to lower boiling materials comprising contacting said high boiling organic materials at a temperature of from about 300° to 1000° C. and at a reaction pressure of from about 2000 to 10,000 psi with an aqueous acidic medium containing, as a promoter, a halogen, a hydrogen halide, a halogen-containing organic compound which can form a halide or a hydrogen halide in the aqueus acidic medium under the process conditions, or mixtures thereof whereby the high boiling organic material and aqueous acidic medium form a substantially single phase system.

4,559,128

METHOD FOR PRODUCING INDUSTRIAL ASPHALTS

Judson E. Goodrich, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1984, Ser. No. 646,336
Int. Cl.[4] C10C 3/00; C08H 13/00
U.S. Cl. 208—22 7 Claims

1. A one-step method of producing an industrial asphalt from a bituminous material which comprises mixing together without air-blowing:

(a) a feed material consisting essentially of a bituminous material having a viscosity of at least 50 centistokes at 350° F. and wherein the feed bituminous material forms a single phase when mixed with 5 percent of 98 percent sulfuric acid; and

(b) from about 0.1 to 20.0 percent by weight of sulfuric acid, said mixing being done at a temperature in the range of 351° to 600° F., whereby the softening point of the feed is substantially increased by 50° to 120° F. and the penetration is significantly decreased by 20 to 80 dmm.

4,559,129

RED MUD AS A FIRST-STAGE CATALYST IN A TWO-STAGE, CLOSE-COUPLED THERMAL CATALYTIC HYDROCONVERSION PROCESS

John G. Reynolds, El Cerrito; S. Gary Yu, Oakland, and Robert T. Lewis, Albany, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1984, Ser. No. 644,737
Int. Cl.[4] C10G 65/00
U.S. Cl. 208—59 18 Claims

1. A two-stage, close-coupled process for hydroprocessing a heavy hydrocarbonaceous feedstock at least 30 volume percent of which boils above 1000° F. and which has greater than 100 parts per million by weight total metel contaminants to produce high yields of transportation fuels boiling below 650° F., which comprises:

(a) introducing said feedstock and red mud having activity sufficient to suppress adverse coke formation under coking conditions and having demetalizing activity into a first-stage hydrothermal zone in the presence of hydrogen; wherein said feedstock and red mud are introduced into said hydrothermal zone under conditions sufficient to substantially demetalate said feedstock and to convert a significant amount of the hydrocarbons in said feedstock boiling above 1000° F. to hydrocarbons boiling below 1000° F.;

(b) rapidly and without substantial reduction of pressure through the system passing red mud entrained effluent of said first-stage hydrothermal zone directly into a second-stage catalytic reaction zone at a reduced temperature relative to said first-stage hydrothermal zone and contacting said effluent with hydroprocessing catalyst under hydroprocessing conditions, including a temperature in the range of 650° F. to 800° F.; and

(c) recovering the effluent from said catalytic reactor zone.

4,559,130

METALS-IMPREGNATED RED MUD AS A FIRST-STAGE CATALYST IN A TWO-STAGE, CLOSE-COUPLED THERMAL CATALYTIC HYDROCONVERSION PROCESS

John G. Reynolds, El Cerrito; S. Gary Yu, Oakland, and Samil Beret, Danville, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1984, Ser. No. 644,739
Int. Cl.[4] C10G 65/00
U.S. Cl. 208—59 19 Claims

1. A two-stage, close-coupled process for hydroprocessing a heavy hydrocarbonaceous feedstock at least 30 volume percent of which boils above 1000° F. and having greater than 100 parts per million by weight total metal contaminants to produce high yields of transportation fuels boiling below 650° F., which comprises:

(a) introducing said feedstock and dispersed metals-impregnated red mud having activity sufficient to suppress adverse coke formation under coking conditions and demetalizing activity, into a first-stage hydrothermal zone in the presence of hydrogen; wherein said feedstock and red mud are introduced into said hydrothermal zone under conditions sufficient to substantially demetalate said feedstock and to convert a significant amount of the hydrocarbons in said feedstock boiling above 1000° F. to hydrocarbons boiling below 1000° F.;

(b) rapidly and without substantial reduction of pressure through the system passing a substantial portion of the red mud-entrained effluent of said first-stage hydrothermal zone directly into a second-stage catalytic reaction zone at a reduced temperature relative to said first-stage hydrothermal zone and contacting said effluent with hydroprocessing catalyst under hydroprocessing conditions, including a temperature in the range of 650° F. to 800° F.; and

(c) recovering the effluent from said catalytic reactor zone.

4,559,131

REACTIVATION OF STEAM-DEACTIVATED CATALYSTS

Joseph N. Miale, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 463,746, Feb. 4, 1983, Pat. No. 4,477,582, which is a continuation-in-part of Ser. No. 249,584, Mar. 31, 1981, abandoned. This application Jul. 16, 1984, Ser. No. 631,682

Int. Cl.[4] C10G *11/05, 47/16*

U.S. Cl. 208—111 **19 Claims**

1. A process for converting a feedstock comprising hydrocarbon compounds to conversion products comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a crystalline zeolite material having silicon-/aluminum atomic ratio of at least about 3.5, said catalyst composition having been contacted with steam under conditions sufficient to deactivate same by removal of aluminum from the zeolite framework and the reactivated by the steps of

contacting said steam-deactivated catalyst composition with an aqueous metal salt solution of from about 0.05 N to about 5 N, said metal being selected from the group consisting of alkali, alkaline earth and transition metals, at a temperature of from about 20° C. to about 100° C. for from about 15 minutes to about 240 minutes, and

contacting said metal salt solution contacted catalyst composition with an aqueous ammonium ion solution of from about 0.05 N to about 5 N at a temperature of from about 20° C. to about 100° C. for from about 15 minutes to about 240 minutes.

4,559,132

UPFLOW PACKED BED CATALYTIC REACTOR WITH PERIODIC BED EXPANSION

Christopher W. Kuehler, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 5, 1981, Ser. No. 308,339

Int. Cl.[4] C10G *9/28*

U.S. Cl. 208—157 **20 Claims**

1. A process for contacting a gas-liquid feed in a reactor vessel containing a packed bed of contact particles, said process comprising

(a) introducing at least a portion of said feed into the lower region of said vessel and passing said portion upwardly through said packed bed of contact particles;

(b) increasing the mass flow rate of feed to said vessel sufficiently to cause a portion of said contact particles within said vessel to form an expanded region within said packed bed, and maintaining said increased flow rate for not more than 20% of the operating period of said process and wherein said mass flow rate of feed is increased for a period no longer than 15 minutes per operating day and at an average frequency within the range of one cycle per minute to one cycle per three hours;

(c) decreasing the increased mass flow rate sufficiently to cause the contact particles in the thus-expanded region to settle into a packed bed; and

(d) withdrawing an effluent stream from the upper region of said vessel.

4,559,133

PROCESS FOR SEPARATING LIQUIDS FROM FINE GRAINED SOLIDS

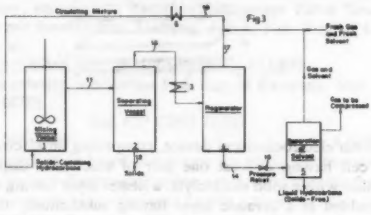
Peter Siegfried, Lindenweg 3, 8521 Uttenreuth-Weiher, Fed. Rep. of Germany; Gerd Brunner, Roth-Eckersmühlen, and Dieter Stützer, Marloffstein, both of Fed. Rep. of Germany, assignors to Peter Siegfried, Uttenreuth-Weiher, Fed. Rep. of Germany

Continuation of Ser. No. 261,349, May 7, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,810

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017876

Int. Cl.[4] C10G *21/20, 21/10*

U.S. Cl. 208—177 **16 Claims**



1. In a process of separating fine solids from oil in which the solids are dispersed, wherein said oil is mixed in a mixing zone with a solvent, transferring the resultant mixture in a separation zone, settling the fine solids below a remaining fluid phase, withdrawing the settled fine solids from said separation zone and feeding the fluid phase into a regeneration zone, in said regeneration zone subjecting said fluid phase to an increase in temperature and/or a reduction of pressure to separate out a first phase rich in oil and a second phase, withdrawing the first phase and recycling the second phase to said mixing zone, the improvement wherein the solvent comprises a first agent and a second agent, the first agent is at least one entraining agent selected from the group consisting of benzene, toluene, methanol, ethanol, an aliphatic ketone, a mixture of hydrocarbons having a boiling range of 20° to 100° C., a mixture of hydrocarbons having a boiling range of 100° to 150° C. and a mixture of hydrocarbons having a boiling range of 150° to 200° C., the second agent is at least one gas selected from the group consisting of carbon dioxide, nitrogen, hydrogen, carbon monoxide, ammonia, methane, ethane, ethylene, propane and butane, the gas being compressed and in super-critical condition wherein the gas is at a temperature above the critical temperature and at a pressure above critical pressure, said mixture of oil, super-critical gas and entraining agent containing 10 to 40 percent by weight of said first agent and 20 to 55 percent by weight of said second agent, maintaining the mixture of oil, super-critical gas and entraining agent at a temperature and a pressure above the critical state where said mixture of oil, super-critical gas and entraining agent constitutes a single fluid phase in the separation zone, segregating in the regenerating zone the fluid phase into a liquid phase and a gas phase containing at least one of the agents and subjecting the recycled gas and the entraining agent to conditions of pressure and temperature in order to reconstitute the super-critical condition.

4,559,134

CONTROL OF FROTH FLOTATION SEPARATION

George E. Wasson, Eighty Four, Pa., assignor to Conoco Inc., Wilmington, Del.

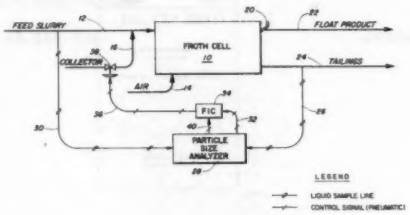
Filed Nov. 30, 1984, Ser. No. 676,897

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **6 Claims**

1. The method of beneficiating a feed slurry of finely divided solids comprising coal and other minerals by froth flotation which comprises:

(a) passing said feed slurry to a flotation zone,
(b) adding a collection reagent to said feed slurry,
(c) inducing formation of a froth in said flotation zone,
(d) recovering as a product from said flotation zone the thusformed froth and a major portion of said coal,
(e) also recovering from said flotation zone a tailings stream containing an increased proportion of said other minerals to said coal as compared with the proportion in said feed slurry,
(f) analyzing solids particle size in said tailings stream and producing therefrom a first control signal,



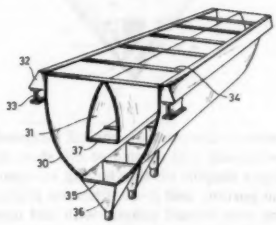
(g) generating an error signal representative of the magnitude and direction of the difference between said first control signal and a predetermined set point,
(h) adjusting the rate of adding collection reagent in step b) responsive to said error signal,
(i) analyzing solids particle size in said feed slurry and producing therefrom a second control signal, and
(j) adjusting said set point responsive to said second control signal.

4,559,135

SHORT, BROAD JIGGING MACHINE, PARTICULARLY FOR FINEST GRAIN SIZING OF MINERALS

Werner Strauss, Bochum, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,570
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319804
Int. Cl.[4] B03B *5/20*
U.S. Cl. 209—455 **2 Claims**



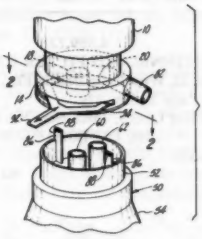
1. A bottom-pulsed jigging machine comprising:
a separating tank including a pair of end walls and a pair of sidewalls, said sidewalls curved inwardly from the top down towards one another;
a plurality of first tie bars spaced apart and connecting the upper edges of said sidewalls;
a jig bed supported on the upper edges of said sidewalls and on said first tie bars;
a pair of internal walls below and supported by said first tie bars and extending the length of said separating tank, said internal walls connected along their upper edges and curved away from one another from the top down to define an open bottom pulsation chamber adapted to support pulsating air for jigging;
means connected in communication with said open bottom pulsation chamber and operable to provide air pulsations thereto;
a plurality of second tie bars spaced apart and connecting the lower edges of said internal walls;
a pair of first support members extending along and connected to the upper edges of respective sidewalls; and
a pair of second support members supporting said tank via respective first support members.

4,559,136

AQUARIUM FILTERING SYSTEM

Denzel J. Dockery, Ponce De Leon, Fla., assignor to Vortex Innerspace Products, Inc., Ponce De Leon, Fla.

Filed Aug. 31, 1984, Ser. No. 646,305
Int. Cl.[4] E04H *3/20*; B01D *25/06*
U.S. Cl. 210—169 **9 Claims**



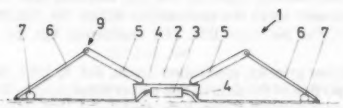
1. An aquarium filtering system comprising:
a pump housing having means forming two fluid ports,
a filter assembly having means forming two fluid ports,
means contained in said filter assembly for filtering water flow from one filter assembly port and to the other filter assembly port,
means for detachably connecting said filter assembly to said pump housing so that, upon connection, said filter assembly ports are fluidly connected in series with said pump housing ports, and
means for automatically fluidly closing said pump housing ports upon disconnection of said filter assembly from said pump housing;
wherein said pump port closing means comprises a valve member disposed in and adapted to fluidly seal each pump port; said member being abuttable with the corresponding filter assembly port, so as to unseal said pump port upon such abutment.

4,559,137

BOOM STRUCTURE IN AN OIL-SPILL-COMBATTING SYSTEM

Lars Lundin, Porvoo, Finland, assignor to Oy Lars Lunden Patent AB, Helsinki, Finland

Filed Mar. 20, 1984, Ser. No. 591,559
Claims priority, application Finland, Mar. 22, 1983, 830955
Int. Cl.[4] E02B *15/04*
U.S. Cl. 210—242.3 **6 Claims**



1. A boom and collecting rope structure for an oil-spill-combatting system mounted on a water craft, which comprises a

pair of booms, each boom being an assembly formed of at least two sections connected end to end by an articulation element and each boom being pivotally connected at one end to a respective side of the water craft, a collecting rope connected in a loose manner between an outer, free end of each of said pair of booms, an oil-removing means provided on the water craft and receiving the collecting rope for removing collected oil therefrom, means for causing reciprocal movement of the rope through said oil-removing apparatus, whereby the rope alternately forms loops on each side of the oil-removing apparatus, an outer section of the assembly forming each boom being pivotable around the articulation element when the outer end of the outer section is at the level of the water surface, so that movements of said outer sections of the respective assembly are synchronous with the movement of the rope through the oil-removing apparatus, whereby the maximally extended position of the outer section of the boom on one side of the water craft corresponds to the outer section of the boom on the other side of the water craft being a minimal distance from the oil-removing apparatus.

4,559,138

END CONNECTED FILTER CARTRIDGES

John F. Harms, II, West Palm Beach, Fla., assignor to Harmsco, Inc., North Palm Beach, Fla.

Filed Oct. 3, 1983, Ser. No. 538,143
Int. Cl.[4] B01D *25/02*
U.S. Cl. 210—316 **7 Claims**

1. A filter cartridge and connection comprising:
(A) a perforated central tube,
(B) an annular filter medium comprising a continuous pleated sheet material surrounding said tube throughout its length,
(C) parallel end discs, one embedding each end of said tube and filter medium and having a central internally threaded open socket of a given depth with an internal radially inwardly extending flange at the innermost end of said socket, and
(D) a continuous externally threaded nipple slightly longer than twice the depth of said socket and screwed into said socket so that the end of said nipple seals against said flange.

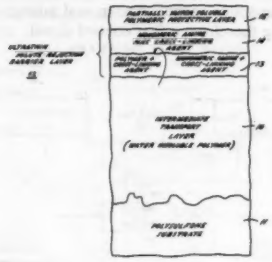
4,559,139

HIGH PERFORMANCE SEMIPERMEABLE COMPOSITE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Tadahiro Uemura, Kyoto, and Masaru Kurihara, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 358,640, Mar. 16, 1982, abandoned, which is a continuation of Ser. No. 103,369, Dec. 13, 1979, Pat. No. 4,387,024. This application Apr. 14, 1982, Ser. No. 368,121
Claims priority, application Japan, Jul. 8, 1981, 56-122921
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—490 **37 Claims**

1. A high performance semipermeable composite memebrane comprising:
(a) a microporous substrate;
(b) an intermediate transport layer comprising a cross-linked polymer made from a water soluble polymer, formed upon and affixed to said microporous substrate; and
(c) an ultrathin solute rejection barrier layer comprising (i) an inner portion affixed to said intermediate transport layer and comprising a crosslinked polymer made from the reaction product of a water soluble polymer and a



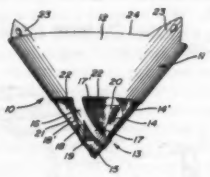
monomer with a crosslinking agent, and (ii) an outer portion affixed to said inner portion (i) and comprising a crosslinked polymer made from the monomer with the crosslinking agent, wherein said water soluble polymer has a reactive amino or hydroxyl group, said monomer has at least two amino groups on an aromatic nucleus comprising from 1 to 3 aromatic carbon rings, and said crosslinking agent has at least 3 acylhalide groups on an aromatic nucleus comprising from 1 to 3 aromatic carbon rings.

4,559,140

PAINT FILTER

Rene Croteau, Contrecoeur, Canada, assignor to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Mar. 30, 1984, Ser. No. 595,409
Int. Cl.[4] B01D *35/28*
U.S. Cl. 210—497.2 **7 Claims**



1. A paint strainer comprising a conical receptacle having a conically tapering side wall formed of stiff sheet material and defining an upper support portion having an open end and a lower filtration portion, said lower filtration portion having a first reinforcing arm formed integral with said upper support portion and terminating at a pointed free end located at the apex of said receptacle, a second reinforcing arm is formed integral with said upper support portion and disposed substantially diametrically opposed to said first reinforcing arm, said second reinforcing arm being connected adjacent said pointed free end of said first reinforcing arm and defining a lower filtration aperture substantially unobstructed at its apex and further side filtration apertures to each side of first and second reinforcing arms and a filtration mesh screen disposed over said filtration apertures as a single-ply screen, said mesh screen being joint-free in the area of said filtration apertures, said first reinforcing arm providing stress distribution and rigidity to said screen in said lower filtration aperture with minimum obstruction to the apex of said filtration aperture of said recep-

tacle to prevent accumulation of paint and obstruction to said mesh screen.

4,559,141

APPARATUS FOR THE SEPARATION OF SOLID AND/OR LIQUID PARTICLES FROM A LIQUID

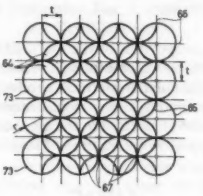
Imre Gyulavári, Debrecen, Hungary, assignor to Novex Találmányfejlesztö és Novexesitolmalyereskedelmi Rt., Budapest, Hungary

Continuation of Ser. No. 124,444, Feb. 25, 1980, abandoned. This application Mar. 3, 1981, Ser. No. 240,159

Claims priority, application Hungary, Mar. 26, 1979, GU-329; Jun. 15, 1979, NO-234

Int. Cl.⁴ B01D *21/02*

U.S. Cl. 210—521 **6 Claims**



1. Lamellar structure with closed cells for the separation of foreign matter from liquids, or for the contacting of the liquid with a gaseous substance, or for the biological treatment or cooling of the liquid, comprising mutually parallel channels, the walls of the channels being circular so that the edges of the individual circles are disposed at the centers of the inside of the adjacent circular element forming closed cells therebetween, and the center point of the arcs coincide with every second intersection point of a notional square or rectangular matrix.

4,559,142

SPLIT FEED FOR THE ANAEROBIC BIOLOGICAL PURIFICATION OF WASTEWATER

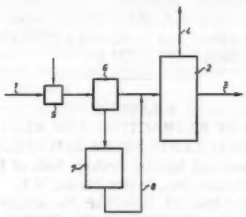
Manfred Morper, Gauting, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 10, 1984, Ser. No. 578,900

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305476

Int. Cl.⁴ C02F *3/28*

U.S. Cl. 210—607 **9 Claims**



1. In a process for the anaerobic biological purification of wastewater containing organic substances, a portion of the latter being metabolizable anaerobically at a low rate and being partially undissolved and partially macromolecular, the improvement comprising, prior to introducing the mainstream of the wastewater to be purified into a reactor operated under anaerobic conditions, separating at least a fraction of the low-rate metabolizable substances from the wastewater into a secondary stream; anaerobically treating said low-rate metabolizable substances independently of the remaining substances in the mainstream of the wastewater to be purified, said anaerobic treating consisting essentially of enzymatic conversion of undissolved substances into dissolved substances and hydrolysis of macromolecular weight substances into lower molecular weight substances; and introducing resultant anaerobically treated low-rate metabolizable substances into the anaerobically operated reactor located in the main stream.

4,559,143

SLUDGE TREATING METHOD

Hiroshi Asada; Kohei Kobayashi, both of Tochigi, and Toshiro Iwama, Tokyo, all of Japan, assignors to Nichikeri Chemical Industry Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 165,217, Jul. 1, 1980, abandoned. This application Jan. 27, 1982, Ser. No. 343,374

Claims priority, application Japan, Jul. 10, 1979, 54-87196

Int. Cl.⁴ C02F *11/14*

U.S. Cl. 210—714 **7 Claims**

1. A method for the treatment of sludge comprising introducing to the sludge, and mixing, an organic fiber having a thickness of less than 20 denier and a length of less than 10 mm, and an effective amount of a polymeric coagulant, wherein the amount of the fiber is adjusted to be 0.05 to 20% by weight based on the solids of the sludge, to coagulate the solids in the sludge, and removing water from the coagulated sludge.

4,559,144

PROCESS FOR CONVERTING SPARINGLY SOLUBLE INORGANIC SALTS OF CATIONIC DYES AND BRIGHTENERS INTO MORE SOLUBLE SALTS OF ORGANIC ACIDS

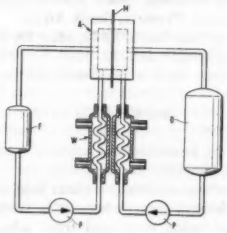
Heinz Pfenninger, Lupsingen, and Beat Bruttel, Böckten, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,484

Claims priority, application Switzerland, Jun. 15, 1982, 3691/82

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—638 **11 Claims**



1. A process for converting sparingly soluble inorganic salts of cationic dyes and brighteners into more soluble salts of organic acids without intermediate isolation of the free base, which comprises replacing the inorganic acid radical of the dye or brightener by the anion of a cyclic or acyclic organic acid by means of Donnan dialysis.

4,559,145

PROCESS FOR PREPARING A ZERO STANDARD SERUM

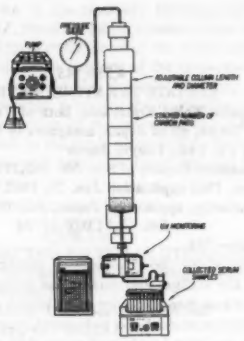
Kenneth C. Hou, San Antonio, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,989

The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.

Int. Cl.⁴ B01D *15/00*

U.S. Cl. 210—679 **22 Claims**



1. A method for the removal of thyroid hormones from human serum which comprises:

contacting, at a pressure differential higher than 1 psi and at a pH of 9.0 to 12.0 said serum with a composite sheet, said composite sheet consisting essentially of a matrix of self-bonding fibers having interdispersed therein carbon particles and up to 1% of a binder, such that better than 90% of said carbon particles have an average diameter less than about 50 microns.

3. A method for the removal of steroid hormones from human serum which comprises:

contacting, at a pressure differential higher than 1 psi and at a pH of 4.0 to 6.0 said serum with a composite sheet, said composite sheet consisting essentially of a matrix of self-bonding fibers having interdispersed therein carbon particles and up to 1% of a binder, such that better than 90% of said carbon particles have an average diameter less than about 50 microns.

4,559,146

METHOD OF CLARIFYING PROTEINACEOUS WASTE WATER CONTAINING SOLID IMPURITIES

Sarel D. Roets, Pretoria, South Africa, assignor to Silverton Tannery Limited, Pretoria, South Africa

Continuation of Ser. No. 376,820, May 10, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,400

Claims priority, application South Africa, May 20, 1981, 81/3392

Int. Cl.⁴ C02F *1/24*

U.S. Cl. 210—705 **18 Claims**

1. In clarifying proteinaceous aqueous waste water containing solid impurities by:

feeding a proteinaceous waste water feed into and through a water treatment zone where it is subjected to various water-purification steps and from which it issues as a clarified product;

coagulating solid impurities in the waste water as it passes through said water treatment zone;

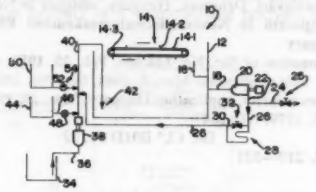
recirculating a proportion of the clarified product through the water treatment zone;

aerating the recirculated clarified product to form a foam, the recirculated foam being mixed with the waste water feed in or upstream of the water treatment zone;

permitting the foam to rise to and float on the surface of the water in the water treatment zone; and

removing said foam and coagulated solids entrapped therein from the surface of the water in the water treatment zone,

the improvement which comprises at least reducing the use of surfactants in foam production by



recirculating a proportion of the clarified product amounting to 20–50% by volume of said waste water feed; and

aerating said recirculated clarified product to form a foam which is continuous and which comprises no less than 90% by volume of air, so that the air recirculated amounts to no less than 18% by volume of said waste water feed.

4,559,147

OPTICAL IMMERSION OIL

Georges Hirth, Huningue, France; Martin Petrzilka, Kaiseraugst, and Inge Pracht, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

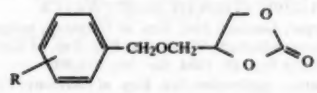
Filed Nov. 30, 1983, Ser. No. 556,677

Claims priority, application Switzerland, Dec. 14, 1982, 7259/82

Int. Cl.⁴ C09K *3/00*; C10M *1/00*

U.S. Cl. 252—1 **9 Claims**

1. An immersion oil comprising at least two components, wherein at least one of said components is a compound of the formula:



I

wherein R is hydrogen or methyl and the second or additional of such components is suitable for use in optical immersion oils, and is selected from the group consisting of 2-(hydroxymethyl) thiophene, lycopane, isophytol, 1,2,3-trimethoxy propane, 1,3-dimethoxy-2-propanol, phytyl methyl ether, aliphatic glycols and glycol ethers said oil having a refractive index n_D of about 1.500 to about 1.525 at 23° C.

4,559,148

METHOD OF EXTRACTING AND REUTILIZING SURFACTANTS FROM EMULSIONS

Samir S. Ashrawi, and Gabriel Prukop, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,574

Int. Cl.⁴ E21B *43/22, 43/40*

U.S. Cl. 252—8.55 D **7 Claims**

1. A method for extracting enhanced oil recovery surfactants from produced emulsions comprising oil, water and surfactant, which comprises:

mixing a produced emulsion with about 3 grams to about 40 grams of butanol or pentanol per liter of emulsion and about 10 grams to about 150 grams of an alkali metal chloride salt per liter of emulsion;

allowing the mixture of produced emulsion, salt and butanol or pentanol to separate into two phases, an oleic phase and an aqueous phase;

mixing the oleic phase with fresh water containing about 1%

to about 10% by weight of isopropanol, ethanol or methanol; and

allowing the mixture of oleic phase, fresh water and isopropanol, ethanol or methanol to separate into two phases, an oleic phase and a second aqueous phase containing substantially all of the enhanced oil recovery surfactants originally within the produced emulsion.

4,559,149

WORKOVER FLUID

Francis J. Shell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 445,311, Nov. 29, 1982, abandoned. This application Jun. 7, 1984, Ser. No. 618,296

Int. Cl.⁴ E21B *43/00*

U.S. Cl. 252—8.55 R **15 Claims**

1. A method for improving the high temperature water loss property of aqueous alkaline clay-free wellbore completion and workover fluids having an initial pH of at least about 9 and densities ranging from about 9 to about 14 lb/gal comprising incorporating therein (1) an electrolyte selected from water soluble inorganic salts, (2) an acid soluble weighting agent, (3) carboxymethyl cellulose as a viscosifier, (4) asbestos as a suspending agent, and (5) a water loss additive comprising naphthalene sulfonate formaldehyde condensates in the form of monovalent or bivalent metal salts having a molecular weight ranging from about 300 to about 3,000.

4,559,150

STABLE COMPOSITION FOR TREATING TEXTILE SUBSTRATES

Carl Becker, and Fritz Heizler, both of Basel, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,931

Claims priority, application Switzerland, Aug. 11, 1982, 4811/82; May 25, 1983, 2839/83

Int. Cl.⁴ D06M *13/00*

U.S. Cl. 252—8.6 **39 Claims**

1. A stable composition for treating textile substrates, which composition comprises at least

(a) an organic solvent which is sparingly soluble or insoluble in water and in which component (b) is dissolved and components (c) and (d) are dissolved or dispersed,

(b) a vehicle for component (c) which is sparingly soluble or insoluble in water,

(c) a fluorescent whitening agent which is sparingly soluble or insoluble in water and which is soluble or dispersible in the vehicle (b), and

(d) a water-soluble acid having a pK value greater than 1.

4,559,151

ANTISTATIC FABRIC CONDITIONER COMPOSITIONS AND METHOD

David Pregozen, Park Ridge, and John J. Hiller, Jr., Old Tappan, both of N.J., assignors to Sterling Drug Inc., New York, N.Y.

Filed May 7, 1984, Ser. No. 608,000

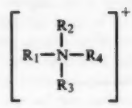
Int. Cl.⁴ D06M *11/00*

U.S. Cl. 252—8.8 **15 Claims**

1. An antistatic fabric conditioner composition comprising:

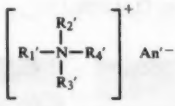
(a) an antistatic-fabric conditioning agent comprising:

(i) a quaternary ammonium salt component selected from the group consisting of a quaternary ammonium salt having the formula:



I

wherein R_1 and R_2 each independently is long chain alkyl having from twelve to twenty-two carbon atoms, R^3 and R^4 each independently is lower-alkyl having from one to three carbon atoms, and An^- is an anion; and a combination of the salt of formula I with a quaternary ammonium salt of the formula:



II

wherein R_1' is long chain alkylamido-lower-alkyl having from ten to twenty carbon atoms in the long chain alkylamido moiety and from one to three carbon atoms in the lower-alkyl moiety, R_2' and R_3' each independently is lower-alkyl having from one to three carbon atoms, An'^- is an anion, and R_4' is lower-alkyl having from one to three carbon atoms or benzyl, or R_4', together with the ammonium nitrogen atom and An'^-, forms a zwitterion group; and

(ii) a lactic acid salt selected from the group consisting of alkali metal lactate, alkaline earth metal lactate and ammonium lactate; and

(b) a carrier for the antistatic-fabric conditioning agent selected from the group consisting of water, ethanol, propanol, isopropanol, an aliphatic hydrocarbon having from two to six carbon atoms, and combinations thereof;

wherein the weight ratio of (i) to (ii) and of the salt of formula I to the salt of formula II each independently is from around 4:1 to around 1:1.

4,559,152

FRICTION-REDUCING MOLYBDENUM SALTS AND PROCESS FOR MAKING SAME

Raymond C. Schlicht, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 188,488, Sep. 18, 1980, abandoned. This application Jun. 17, 1982, Ser. No. 389,339

Int. Cl.⁴ C16M *1/48, 5/24*

U.S. Cl. 252—32.7 E **12 Claims**

1. In a process for making a lubricating oil additive comprising:

effecting an oxidation reduction reaction at between room temperature and 80° C., between a tri- to hexavalent oxymolybdenum compound and at least one organophosphorus acid or acid precursor consisting of an olefin: P_2S_5 reaction product or of an alcoholyzed olefin: P_2S_5 reaction product wherein the olefin moiety contains from 3 to 30 carbon atoms;

the improvement comprising the combination of steps of:

employing said acid or acid precursor in a molar charge ratio with said oxymolybdenum compound of Mo:P of 1:1 to 1:2;

in a mixture of an inert solvent with a polar, oxygen-containing, co-solvent selected from the group consisting of esters, ethers, alcohols, ketones, lactones, amides, lactams and mixtures thereof;

using a ratio of polar cosolvent to solvent ranging from 1:10 to 10:1;

removing the water of reaction formed:

filtering; and,

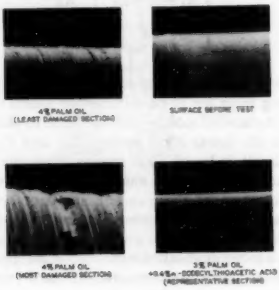
removing said solvent and cosolvent to recover said additive.

4,559,153

METAL WORKING LUBRICANT

Bernard A. Baldwin, and Harold W. Mark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 25, 1983, Ser. No. 545,308
Int. Cl.[4] C10M *1/38*
U.S. Cl. 252—48.6 **17 Claims**



1. A lubricant composition for metal fabrication comprising a major proportion of a mineral or synthetic oil having incorporated therein (1) from 0.1 to about 10 percent by weight of the finished composition of at least one alkylthiohydrocarbylcarboxylic acid and (2) from 1–6 weight percent of a vegetable oil or animal fat sufficient to improve extreme pressure properties of the oil and to reduce wear and improve surface appearance of parts in highly loaded contact.

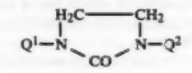
4,559,154

HEAT PUMPS

Richard L. Powell, Winsford, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jul. 31, 1984, Ser. No. 636,272
Claims priority, application United Kingdom, Aug. 10, 1983, 8321569
Int. Cl.[4] C09K *5/04*
U.S. Cl. 252—69 **2 Claims**

1. An absorption heat pump wherein the working fluid is a saturated fluorohydrocarbon or fluorohydrocarbon ether having from 3 to 5 carbon atoms and the solvent is a compound of the formula:



wherein each of Q^1 and Q^2, independently, represents hydrogen or a C_{1-4} alkyl radical.

4,559,155

HYDROCARBYL SUBSTITUTED CARBOXYLIC ACYLATING AGENT DERIVATIVE CONTAINING COMBINATIONS, AND FUELS CONTAINING SAME

Casper J. Dorer, Jr., Lyndhurst, and Katsumi Hayashi, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 404,845, Aug. 9, 1982. This application Mar. 12, 1985, Ser. No. 711,111
Int. Cl.[4] F16K *31/44*
U.S. Cl. 252—73 **111 Claims**

1. A composition comprising a substantially inert normally liquid diluent, and from about 10% to about 90% by weight of:

(A) a first component selected from the group consisting of:

(i) an oil-soluble ethylene backbone polymer having a number average molecular weight in the range of about 500 to about 50,000;

(ii) hydrocarbyl-substituted phenol of the formula

$$(R^*)_a—Ar—(OH)_b \qquad (I)$$

wherein R* is a hydrocarbyl group selected from the group consisting of hydrocarbyl groups of from about 8 to about 30 carbon atoms and polymers of at least 30 carbon atoms, Ar is an aromatic moiety having 0 to 4 optional substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said optional substituents, and a and b are each independently an integer of 1 up to 5 times the number of aromatic nuclei present in Ar with the proviso that the sum of a and b does not exceed the unsatisfied valences of Ar;

(iii) mixtures of (i) and (ii); and

(B) as a second component, the oil-soluble reaction product of (B)(I) a hydrocarbyl-substituted carboxylic acylating agent with (B)(II) one or more amines, one or more alcohols, or a mixture of one or more amines and/or one or more alcohols, the hydrocarbyl substituent of said agent (B)(I) being selected from the group consisting of

(i') one or more mono-olefins of from about 8 to about 30 carbon atoms;

(ii') mixtures of one or more mono-olefins of from about 8 to about 30 carbon atoms with one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of polymers of mono-1-olefins of from 2 to 8 carbon atoms, or the chlorinated or brominated analogs of such polymers; and

(iii') one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of

(a) polymers of mono-olefins of from about 8 to about 30 carbon atoms;

(b) interpolymers of mono-1-olefins of from 2 to 8 carbon atoms with mono-olefins of from about 8 to about 30 carbon atoms;

(c) one or more mixtures of homopolymers and/or interpolymers of mono-1-olefins of from 2 to 8 carbon atoms with homopolymers and/or interpolymers of mono-olefins of from about 8 to about 30 carbon atoms; and

(d) chlorinated or brominated analogs of (a), (b), or (c).

4,559,156

PROCESS FOR DISPERSING PARTICULATE MATERIAL IN AQUEOUS SYSTEMS

Brian Greaves, and Paul Ingham, both of Runcorn, England, assignors to Dearborn Chemicals, Ltd., Widnes, England

Continuation of Ser. No. 263,317, May 13, 1981, abandoned. This application Jul. 16, 1984, Ser. No. 631,095
Claims priority, application United Kingdom, Nov. 18, 1980, 8036932
Int. Cl.[4] C02F *5/10*
U.S. Cl. 252—82 **2 Claims**

1. Method of inhibiting deposition of clay, silt, and ferric oxide particulate material in an aqueous cooling system con-

taining said particulate material and at least 300 ppm calcium hardness comprising adding to the system at least about 5 ppm of a copolymer of 25 to 50 mole percent methacrylic acid and 50 to 75 mole percent acrylamide, said copolymer having a molecular weight of about 5,000.

4,559,157

COSMETIC APPLICATOR USEFUL FOR SKIN MOISTURIZING

James A. Smith, Old Tappan, and James E. Reilly, Wanaque, both of N.J., assignors to Creative Products Resource Associates, Ltd., Clifton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,252

Int. Cl.[4] B05D *3/02*

U.S. Cl. 252—90 **10 Claims**

1. A cosmetic applicator comprising a porous sheet impregnated with an oil-in-water emulsion comprising an oil phase comprising at least one emollient oil and at least one emollient nonionic wax stabilizer dispersed in an aqueous phase comprising at least one polyhydric alcohol emollient, and at least one organic water-soluble detergent, said emulsion being adapted to evenly coat an effective moisturizing amount of emollients on a wet skin surface when said applicator is contacted with said skin under conditions of pressure wherein the emulsion comprises about 50–85% water, about 4–12% emollient oil, about 3.0–10% emollient nonionic wax stabilizer, 5–20% polyhydric alcohol emollient and about 0.5–10% detergent.

4,559,158

ORGANIC CYANAMIDE COMPOUNDS AS ACTIVATORS FOR INORGANIC PER COMPOUNDS

Christian Hase, Erkrath, and Edgar Koeppelmann, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,114

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304848

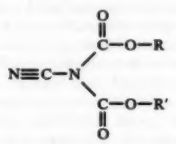
Int. Cl.[4] C11D *7/54*

U.S. Cl. 252—102 **38 Claims**

1. A composition comprising

a. at least one inorganic peroxy-group containing compound; and

b. an activating quantity of at least one cyanamide compound of the formula



(I)

wherein R and R′ can be the same or different and are each C_1–C_6 alkyl, cyclohexyl, or benzyl.

4,559,159

COPOLYMERS, THEIR PREPARATION AND THEIR USE AS ASSISTANTS IN DETERGENTS AND CLEANSING AGENTS

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Wolfgang Trieselt, Ludwigshafen; Richard Mueller, Bad Durkheim; Paul Diessel, Mutterstadt, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,806

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305637

Int. Cl.[4] C08F *8/14, 220/06;* C11D *3/37;* D06L *3/02*

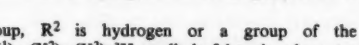
U.S. Cl. 252—174.24 **8 Claims**

1. A water-soluble copolymer, which consists of:

from 40–90% by weight of at least one ethylenically unsaturated monocarboxylic acid of 3–5 carbon atoms and from 60–10% by weight of at least one ethylenically unsaturated dicarboxylic acid of 4–8 carbon atoms and/or the corresponding dicarboxylic anhydride, said water-soluble copolymer being esterified with from 5–50% by weight, based on the total weight of the carboxylic acids and, where relevant, of the carboxylic acid anhydrides, of at least one compound of formula I:

$$R^1Z[(X^1)m.(X^2)n.(X^3)o]H$$

wherein R^1 is C_1–C_{18}-alkyl or alkylphenyl, wherein said alkyl substituent is of 1 to 12 carbon atoms, Z is oxygen or a



group, R^2 is hydrogen or a group of the formula $[(X^1)_m.(X^2)n.(X^3)o]H$ or alkyl of 1 to 4 carbon atoms, X^1 is a copolymerized ethylene oxide unit, X^2 is a copolymerized propylene oxide unit, X^3 is a copolymerized butylene oxide unit and m, n and o are each 0 or an integer up to 100, the sum of m+n+o being from 1 to 100 and the alkylene oxide units being copolymerized as blocks in any desired sequence or being copolymerized statistically, and its water-soluble salts.

4,559,160

HIGHLY STABLE DICHLOROBENZIDINE DIHYDROCHLORIDE SLURRY AND A METHOD FOR PREPARING SUCH

Steven C. Schultz, North Muskegon, Mich., assignor to Bofors Nobel, Inc., Muskegon, Mich.

Filed Feb. 9, 1984, Ser. No. 578,550

Int. Cl.[4] C09K *3/00;* B01J *13/00;* C09D *11/00*

U.S. Cl. 252—182 **21 Claims**

1. A stable dichlorobenzidine dihydrochloride slurry, consisting essentially of:

(a) dichlorobenzidine dihydrochloride in an amount such that the diamine amount constitutes from about 35% to about 50% by weight;

(b) free mineral acid, selected from the group consisting of hydrochloric acid, phosphoric acid and sulfuric acid, in an amount ranging from about 1% to about 10% by weight;

(c) water in an amount ranging from about 40% to about 50% by weight; and

(d) having a viscosity within the range of about 10 Poise to about 500 Poise.

4,559,161

LIQUID CRYSTAL COMPOSITION

Katsumori Takei, and Haruo Nakamura, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Nagano, Japan

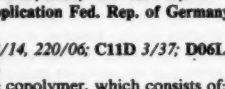
Filed Feb. 16, 1983, Ser. No. 466,989

Claims priority, application Japan, Feb. 18, 1982, 57-24904; Feb. 18, 1982, 57-24907

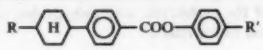
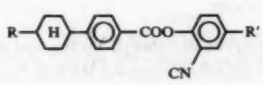
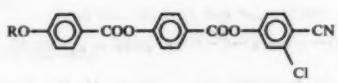
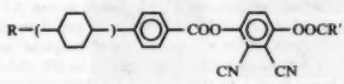
Int. Cl.[4] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299.63 **9 Claims**

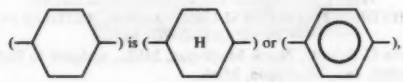
1. A liquid crystal composition, comprising at least one compound from each of the groups of compounds specified by each general formula below in the weight percent concentrations as indicated:

compound	weight percentage (wt %)
(1) 	40–60

-continued

compound	weight percentage (wt %)
(2) 	0–20
(3) 	0–20
(4) 	5–20
(5) 	5–15
(6) chiral nematic liquid crystal	0.05–5

wherein



and each R and R′ is a straight chain alkyl group having from one to eight carbon atoms.

4,559,162

COMPOSITIONS OF POLYMERS BASED ON ACRYLIC ACID, SOLVENTS, SURFACTANTS AND, IF APPROPRIATE, SILICONE OILS, THEIR PREPARATION AND THEIR USE AS ANTI-FOAMS AND DEAERATING AGENTS

Heinz Abel, Reinach, and Rosemarie Töpfl, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,309

Claims priority, application Switzerland, Mar. 10, 1981, 1624/81

Int. Cl.⁴ B01D *19/04;* **C09K** *3/00*

U.S. Cl. 252—321 **23 Claims**

1. A surfactant-containing composition, consisting essentially of

(a) 8 to 30 percent by weight of a homopolymer of an aliphatic C_1–C_8-alkyl acrylate or methacrylate or a copolymer of this alkyl ester with styrene or acrylic or methacrylic acid,

(b) 10 to 40 percent by weight of a hydronaphthalene, an alkylbenzene, an acyclic or cyclic alkanol having 4 to 12 carbon atoms, an alkylene oxide adduct of a polyhydric alcohol having 2 to 6 carbon atoms or a maleate of aliphatic C_4–C_{22}-alcohols,

(c) 0 to 20 percent by weight of a hydrophobic silicone oil,

(d) 0 to 10 percent by weight of an anionic surfactant,

(e) 0 to 10 percent by weight of a non-ionic surfactant selected from adducts of an alkylene oxide and an aliphatic monoalcohol of 8 to 22 carbon atoms, an unsubstituted or alkyl- or phenyl-substituted phenol, or a fatty acid, amine or amide each of 8 to 22 carbon atoms; alkylene oxide condensation products; reaction products of a fatty acid and hydroxyalkyl or alkoxy-alkyl-amine or alkylene oxide adducts of these reaction products; and fatty alcohols of 8 to 22 carbon atoms,

(f) 0 to 10 percent by weight of a surface-active, hydrophilic siloxanoxyalkylene copolymer,

(g) 0 to 50 percent by weight of a mixture of paraffins or paraffins in admixture with naphthenes or aromatics and

(h) 0 to 70 percent by weight of additives selected from water, high-molecular-weight acids, aqueous ammonia, and aqueous solutions of an alkali metal hydroxide,

at least 2% of one of the components (d) and (e) being employed.

19. A process for defoaming and deaerating aqueous systems, which comprises employing a composition according to claim 1.

4,559,163

HALIDE FREE OCTAHYDROPHENANTHRIDINE CORROSION INHIBITORS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 200,817, Oct. 27, 1980. This application Mar. 12, 1984, Ser. No. 588,621

Int. Cl.⁴ C23F *11/14*

U.S. Cl. 252—392 **3 Claims**

1. A corrosion inhibiting composition of matter comprising a non-halogen salt of 9-pentyl-1,2,3,4,5,6,7,8-octahydrophenanthridine and an effectiveness enhancing amount of an oxyalkylated surfactant.

2. A process of inhibiting corrosion in a system containing stainless steel which comprises treating such system with a corrosion inhibiting composition comprising a non-halogen salt of 9-pentyl-1,2,3,4,5,6,7,8-octahydrophenanthridine and an effectiveness enhancing amount of a surfactant.

4,559,164

ELECTRICALLY CONDUCTIVE POLY(BUTYLENE TEREPHTHALATE) MOLDINGS AND COMPOSITIONS THEREFOR

Robert J. Kostelnik, Westchester, and Allen D. Wambach, Newtown Square, both of Pa., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 9, 1982, Ser. No. 356,264

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **11 Claims**

1. A plastic composition characterized by electroconductivity and comprising up to 90 wt.% poly(1,4-butylene terephthalate) resin, an amount of finely divided carbon intimately distributed throughout said composition sufficient to reduce volumn resistivity to a value of about 1.2×10^7 ohms/sq.cm and below and electroconductivity enhancing amount of an additive selected from the group consisting of from about 1 to about 50% the polycarbonate of bisphenol-A, from about 5 to about 50% glass fibers, from about 2 to about 25% rubbery polymers which improve impact resistance, and blends thereof, each of said additives being percentages by weight of the total composition.

4,559,165

TRANSPARENT CONDUCTING LAYER

Hans Kohlmüller, and Waldemar Nippe, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,293

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3211066

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—512 **2 Claims**

1. A transparent display material which is resistant toward electrochemical reduction, which comprises a conducting layer composition of tin oxide or indium oxide or a mixture thereof and at least one metal selected from copper, silver, gold, iron, cobalt, nickel, ruthenium, rhodium, palladium,

osmium, iridium and platinum or a mixture thereof at a concentration from about 10^{-3} to 3 percent by weight relative to the tin oxide and/or indium oxide.

4,559,166

ELECTRICALLY CONDUCTIVE COMPOSITION

Hiroshi Morinaga, Yotsukaido; Satoru Miyake, Ichihara, and Terumi Sato, Ichihara, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,215

Claims priority, application Japan, Nov. 30, 1983, 58-226622; Nov. 30, 1983, 58-226623; Nov. 30, 1983, 58-226624

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 **15 Claims**

1. An electrically conductive composition comprising 100 parts by weight of a copper powder, from 2 to 100 parts by weight of a resin binder, and from 0.1 to 30 parts by weight of an additive agent, wherein the additive agent is at least one compound selected from the group consisting of α-ketols, aliphatic and aromatic thiols, thiodiarylamines, tall oils, rosins, rosin esters, higher fatty acid amides, o-aminophenols, 2,2'-dipyridyls, and 2,2'-diquinolyls.

4,559,167

ZINC OXIDE VARISTOR

Elias Jülke, Wettingen; Tony Kaiser, Buchs; Maged A. Osman, Zürich, and Roger Perkins, Baden-Rütihof, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 29, 1984, Ser. No. 676,303

Claims priority, application Switzerland, Dec. 22, 1983, 6851/83

Int. Cl.[4] H01C *7/10*

U.S. Cl. 252—518 **9 Claims**

1. A zinc oxide varistor comprising a body composed predominantly of zinc oxide, two mutually opposite contact faces and a lateral surface extending around the body and between the contact faces, a coating on said lateral surface, said coating including at least one oxygen barrier layer comprising an inorganic filler suspended in an organic matrix material of at least one organic polymer, said inorganic filler being an inorganic non-metallic substance, the oxygen diffusion coefficient of which is smaller than that of the organic matrix material.

2. A zinc oxide varistor comprising a body composed predominantly of zinc oxide, two mutually opposite contact faces and a lateral surface extending around the body and between the contact faces, a coating on said lateral surface, said coating including at least one oxygen barrier layer comprising an inorganic filler suspended in an organic matrix material of at least one organic polymer, said inorganic filler being an inorganic substance which releases oxygen when oxygen partial pressure surrounding the lateral surface falls below a defined positive limit value.

4,559,168

USE OF MACROCYCLIC LACTONE IN AUGMENTING OR ENHANCING AROMA OR TASTE OF CONSUMABLE MATERIALS

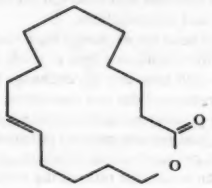
Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Luccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J.; Manfred H. Vock, Locust, N.J., and Wilhelmus J. Wiegers, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 617,584, Jun. 5, 1984, which is a division of Ser. No. 514,523, Jul. 18, 1983, Pat. No. 4,490,404. This application Feb. 6, 1985, Ser. No. 698,833

Int. Cl.[4] A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 A **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfume polymer comprising the step of intimately admixing with a polymer, an aroma augmenting or enhancing quantity of a "cis" or "trans" isomer or a mixture of "cis" and "trans" isomers of the compound defined according to the structure:



4,559,169

STABLE LIQUID DETERGENTS CONTAINING ANIONIC SURFACTANT AND MONOSULFONATED BRIGHTENER

Jean Wevers, Grimbergen, Belgium; Linda A. Halas, Cincinnati, Ohio, and Philippe R. Peltre, Neuilly sur Seine, France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 17, 1984, Ser. No. 642,023

Int. Cl.[4] C09K *11/02, 11/06*

U.S. Cl. 252—543 **11 Claims**

1. A stable isotropic liquid laundry detergent composition comprising, by weight:

(a) from about 3% to about 50% of an anionic synthetic surfactant; and

(b) from about 0.01% to about 1% of the monosulfonated brightener 4,4'-bis((4-anilino-6-morpholino-1,3,5-triazin-2-yl)amino)-2-stilbenesulfonic acid, or a water-soluble salt thereof, which represents at least about 60% of the total brightener in the composition; said composition containing less than about 2% of quaternary ammonium cationic surfactants having 2 chains, each containing an average of from about 16 to about 22 carbon atoms.

4,559,170

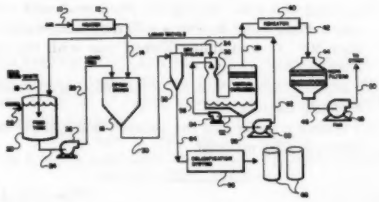
DISPOSAL OF BEAD ION EXCHANGE RESIN WASTES

Richard L. Gay, Canoga Park, and LeRoy F. Grantham, Calabasas, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 3, 1983, Ser. No. 548,267

Int. Cl.[4] G21F *9/08, 9/28*

U.S. Cl. 252—628 **13 Claims**



1. A process for reducing the volume of a bead ion exchange resin waste, said beads having a mean diameter of about 500 to 800 microns and said waste being contaminated with a member selected from the group consisting of the radionuclides Cs^{134}, Cs^{137}, Co^{58}, Co^{60}, I^{129}, and mixtures thereof, said bead ion exchange resin waste containing water on the surface of ion exchange resin beads and water inside said ion exchange resin beads, which consists essentially of:

introducing said bead ion exchange resin waste in the form of a finely atomized spray into a spray drying zone and contacting it with a hot gas stream within said zone, said gas stream having a temperature in the range of about 200°

to 450° C. and sufficient to vaporize the water on the surface of said ion exchange resin beads and to remove the water inside said ion exchange resin beads, but insufficient to oxidize or combust said bead ion exchange resin waste or volatilize said radionuclides;

maintaining said bead ion exchange resin waste in said spray drying zone for a residence time of about 3 to 12 seconds;

removing from said zone dry ion exchange resin beads containing said radionuclides and containing substantially no water, and a gaseous nonradioactive product comprising water vapor, said gaseous product containing substantially no oxidation or combustion products of said bead ion exchange resin waste, the ratio of the volume of said bead ion exchange resin waste to said dry ion exchange resin beads being in the range of about 1.5:1 to 3:1; and

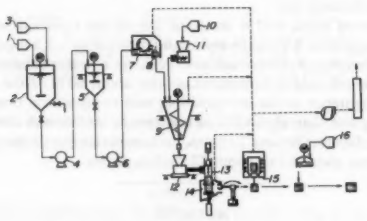
separating said dry ion exchange resin beads from said gaseous nonradioactive product.

4,559,171

HEATING PROCESS FOR SOLIDIFYING A CRUD

Masaru Hayashi, Tokyo, and Tomoyuki Okumura, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 20, 1983, Ser. No. 459,511
Claims priority, application Japan, Feb. 1, 1982, 57-13320
Int. Cl.⁴ G21F *9/16*
U.S. Cl. 252—629 **18 Claims**



1. A process for treating a radioactive waste through solidification, which comprises

(i) adding a nonionic high molecular flocculant to a slurry containing a radioactivated crud to precipitate the crud, concentrating the thus treated slurry and separating the crud from the slurry,

(ii) drying said crud, mixing the dried crud with a frit of a low melting point having a softening temperature of less than 500° C. and filling a steel can with the resulting mixture,

(iii) heating the steel can to effect sintering to solidify said resulting mixture, and

(iv) sealing a surface of the sintered body in the steel can with a sealing material.

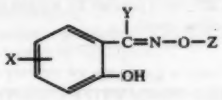
4,559,172

PROCESS FOR ACYLATION WITH NOVEL ACYLATING AGENT

Ikuo Hayashi, Koriyama; Keizo Ogihara, Sukagawa; Tadao Itikawa, Fukushima, and Kiyoshi Shimizu, Koriyama, all of Japan, assignors to Nitto Boseki, Fukushima, Japan

Filed May 1, 1984, Ser. No. 605,781
Claims priority, application Japan, May 4, 1983, 58-78572
Int. Cl.⁴ C07C *103/52, 79/46, 125/06, 67/02*
U.S. Cl. 260—112.5 R **9 Claims**

1. A acylation process which comprises using as the acylating agent an o-hydroxy-substituted aromatic oxime ester represented by the general formula (I)



(I)

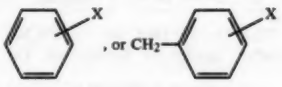
wherein X represents H, Cl, NO_2, $CO_2C_2H_5$, CO_2CH_3, $CONH_2$ or CN, Y represents H, CH_3, or C_6H_5, and Z represents an acyl group represented by the general formula (II)

(II)

where R_1 represents H, $C_{1\text{-}10}$ alkyl, allyl, aralkyl, N-protected amino acid moiety, or a peptide comprising protected amino acids; and mixing said acylating agent with an amine substance represented by the general formula (III)

(III)

wherein R_2 represents H, straight chain or branched chain $C_{1\text{-}5}$ alkyl,



where X is as defined above and T represents $C_{1\text{-}10}$ alkyl, allyl, aralkyl, amino acid moiety with a protected acid component, or a peptide comprising protected amino acids to form a compound represented by the general formula (IV)

(IV)

wherein R_2, Z and T are as defined above.

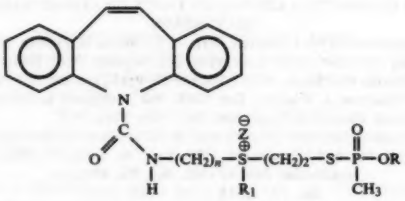
4,559,173

N-SUBSTITUTED DIBENZ[B,F]AZEPINE SALTS

Charles A. Flentge, Lake Villa, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 4, 1983, Ser. No. 548,742
Int. Cl.⁴ C07D *223/22*
U.S. Cl. 260—239 D **7 Claims**

1. A compound having the formula:



wherein Z is a biologically compatible counter ion, n is an integer from 2 to 6 and R and R_1 are each independently lower alkyl.

4,559,174

PROCESS FOR THE MANUFACTURE OF 5-CARBAMOYL-10-OXO-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINE

Ernst Aufderhaar, Kaiseraugst, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 519,620, Aug. 2, 1983, abandoned, which is a continuation of Ser. No. 198,886, Oct. 20, 1980, abandoned. This application Dec. 12, 1983, Ser. No. 559,861

Claims priority, application Switzerland, Oct. 30, 1979, 9703/79

Int. Cl.⁴ C07D *223/28*

U.S. Cl. 260—239 D **1 Claim**

1. A process for the manufacture of 5-carbamoyl-10-oxo-10,11-dihydro-5H-dibenz[b,f]azepine which comprises the steps of:

(a) nitrating 5-cyano-5H-dibenz[b,f]azepine with a nitrating agent so as to obtain 5-cyano-10-nitro-5H-dibenz[b,f]azepine;

(b) reducing 5-cyano-10-nitro-5H-dibenz[b,f]azepine with a reducing agent to 5-cyano-10-isonitroso-10,11-dihydro-5H-dibenz[b,f]azepine;

(c) hydrolysing 5-cyano-10-isonitroso-10,11-dihydro-5H-dibenz[b,f]azepine to obtain 5-cyano-10-oxo-10,11-dihydro-5H-dibenz[b,f]azepine; and

(d) hydrolysing 5-cyano-10-oxo-10,11-dihydro-5H-dibenz[b,f]azepine to obtain 5-carbamoyl-10-oxo-10,11-dihydro-5H-dibenz[b,f]azepine.

4,559,175

HALO-SUBSTITUTED DIPHOSPHA-S-TRIAZINES AND THEIR DERIVATIVES

Kazimiera J. L. Paciorek, Corona del Mar; Reinhold H. Kratzer, Irvine; David H. Harris, Sierra Madre; Mark E. Smythe, Pasadena, and James H. Nakahara, Irvine, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 601,873

Int. Cl.⁴ C07C *117/00;* **C07F** *9/26*

U.S. Cl. 260—349 **11 Claims**

9. The compound 1,3-bis(azidophenylphospha)-5-perfluoro-n-heptyl-2,4,6-triazine.

4,559,176

PROCESS FOR THE PRODUCTION OF BENZANTHRONE

Martin Bürli, Magden; Jacques Bersier, Riehen; Eric Plattner, Seltisberg, and Hans-Ulrich Herrmann, Basel, all of Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

Filed Jul. 9, 1984, Ser. No. 628,884

Claims priority, application Switzerland, Jul. 12, 1983, 3820/83

Int. Cl.⁴ C07C *50/22*

U.S. Cl. 260—352 **6 Claims**

1. A process for the production of benzanthrone by reacting anthraquinone with glycerol and/or acrolein in the presence of a reducing agent, in concentrated sulfuric acid as reaction medium, wherein anthrone is used as reduci gent.

4,559,177

QUINONE DERIVATIVES

Tetsuya Okutani, and Giichi Goto, both of Takatsuki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

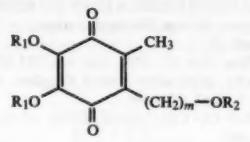
Filed Jun. 30, 1980, Ser. No. 164,018

Claims priority, application Japan, Jun. 28, 1979, 54-82381

Int. Cl.⁴ C07C *50/28, 69/007, 69/145, 69/78*

U.S. Cl. 260—396 R **13 Claims**

1. A compound of the formula:



wherein m is an integer of 11 to 22; R_1 is alkyl having 1 to 4 carbon atoms; and R_2 is hydrogen, alkyl having 1 to 4 carbon atoms or carboxylic acyl having 1 to 8 carbon atoms.

4,559,178

RESOLUTION OF 3-BENZOYLTHIO-2-METHYL-PROPANOIC ACID WITH (+)-DEHYDROABIETYLAMINE

George C. Buzby, Jr., Penllyn, and Henry G. Schouten, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 235,205, Feb. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,705, Oct. 6, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,126

Int. Cl.⁴ C07C *153/07*

U.S. Cl. 260—455 R **3 Claims**

1. A process for the resolution of (±)-3-benzoylthio-2-methyl-propanoic acid to obtain the (−)isomer thereof, which process comprises the following steps:

(a) starting with a racemic mixture of said (±)-3-benzoylthio-2-methyl-propanoic acid;

(b) adding thereto 0.40–0.60 moles of (+)-dehydroabietylamine per mole of (±)-3-benzoylthio-2-methyl-propanoic acid as the resolving agent, in the presence of an aliphatic carboxylic acid lower alkyl ester, the acid and alcohol portions of which are lower alkyl groups of 1 to 4 carbon atoms, as the resolution solvent;

(c) crystallizing out and isolating the (−)-3-benzoylthio-2-methyl-propanoic acid, (+)-dehydroabietylamine salt, which is dextrorotary;

(d) hydrolyzing the resulting dextrorotary salt from (c) with a base to separate the (+)-dehydroabietylamine resolving agent from the (−)-3-benzoylthio-2-methyl propanoate; and

(e) hydrolyzing the (−)-3-benzoylthio-2-methyl-propanoate with an acid to form the acid thereof.

4,559,179

FLUORINE-CONTAINING VINYL COMPOUND

Iwao Hisamoto, Osaka; Chiaki Maeda, Kyoto, and Masaru Hirai, Osaka, all of Japan, assignors to Daikan Kogyo Co., Ltd., Osaka, Japan

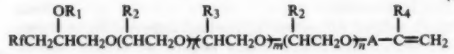
Filed Apr. 5, 1984, Ser. No. 596,901

Claims priority, application Japan, Apr. 12, 1983, 58-64222

Int. Cl.⁴ C07C *143/68*

U.S. Cl. 260—456 F **6 Claims**

1. A fluorine-containing vinyl compound of the formula:



(I)

wherein Rf is perfluoroalkyl of 4 to 20 carbon atoms, R_1 is hydrogen, —COH, —$COCH_3$, or —COC_2H_5, one of R_2 and R_3 is hydrogen and the other is methyl, R_4 is hydrogen or methyl, A is selected from the group consisting of an aliphatic or aromatic divalent group, CO and SO_2 and l, m and n are each an integer of 0 to 40 and satisfy $0<l+m+n\leqq 40$.

4,559,180

TRANSESTERIFICATION OF ESTERS

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, England

Filed Nov. 15, 1983, Ser. No. 551,863

Claims priority, application United Kingdom, Nov. 26, 1982, 8233765; Jan. 7, 1983, 8300444

Int. Cl.[4] C07C 67/02, 67/03, 68/00

U.S. Cl. 260—463 15 Claims

1. A process for the transesterification of a carboxylic acid ester or carbonic acid ester which process comprises reacting the carboxylic acid ester or the carbonic acid ester under transesterification conditions with an alcohol in the presence, as catalyst, of

(A) a Lewis base containing an element selected from the group consisting of nitrogen, phosphorus, arsenic, antimony and bismuth and

(B) an epoxide.

4,559,181

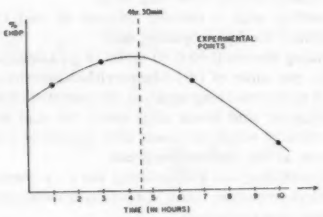
HYDROXY-DIPHOSPHONIC ACID DERIVATIVES OF HIGHER CARBOXYLIC ACIDS

Yves Leroux, Paris, France, assignor to Minemet Rechreche, Trappes, France

Continuation-in-part of Ser. No. 411,285, Aug. 25, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 563,933

Int. Cl.[4] C07F 9/38

U.S. Cl. 260—502.4 A 27 Claims



1. A process for production of hydroxy-diphosphonic acid derivatives of higher carboxylic acids comprising:

(a) mixing said carboxylic acid and a tri-valent phosphorous reagent selected from the group comprising the tri-halogenides of phosphorous and mixtures of tri-halogenides and phosphorous acid, to form a reaction mixture, wherein the molar ratio of said tri-valent phosphorous reagent and said carboxylic acid is in the range of about 13:12 to 18:12; and

(b) heating said reaction mixture of (a) to a temperature in the range of about 80° to 110° C. for a time in the range of about 3 to 20 hours.

4,559,182

METHOD FOR PURIFYING CRESIDINE SULFONIC ACID BY RESIN EXTRACTION

Henry M. Grotta, Delaware, Ohio, assignor to Buffalo Color Corporation, West Paterson, N.J.

Filed Nov. 9, 1981, Ser. No. 319,608

Int. Cl.[4] C07C 143/64

U.S. Cl. 260—509 6 Claims

1. A method for removing residual cresidine from impure p-cresidine sulfonic acid which impure p-cresidine sulfonic acid contains from about 2 parts per billion to about 1500 parts per million of cresidine, said method comprising contacting an aqueous solution of the p-cresidine sulfonic acid with a sufficient quantity of particles of a crosslinked lipophilic porous resin, having a surface area of from about 150 to about 5,000 meters per gram and an average pososity of from about 0.2 to about 0.8 ml of pore per ml of solid in the particles, for a sufficient time to reduce the concentration of p-cresidine in the cresidine sulfonic acid to less than 2 parts per billion.

4,559,183

PREPARATION OF CARBOXYLIC ACID ANHYDRIDES

Colin Hewlett, Middlesbrough, England, assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation of Ser. No. 826,810, Aug. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 394,220, Sep. 4, 1973, abandoned. This application Aug. 27, 1984, Ser. No. 644,294

Int. Cl.[4] C07C 51/12

U.S. Cl. 260—546 8 Claims

1. A process for the preparation of an anhydride of an alkanoic monocarboxylic acid which comprises reacting a feed consisting essentially of an alkanoic carboxylate ester or an alkyl hydrocarbyl ether or a mixture of said ester and said ether with carbon monoxide and a halide which is an iodide under substantially anhydrous conditions in the presence of a rhodium catalyst and in the presence of an added promoter for said catalyst at a temperature of 20° to 500° C. and under a carbon monoxide partial pressure of 0.1 to 15,000 psig, said promoter being a lithium compound.

4,559,184

PHOSPHATE ESTER SYNTHESIS WITHOUT PHOSPHORYLATION CATALYST

Silvio L. Giolito, Whitestone, N.Y., and Stanley B. Mirviss, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 14, 1983, Ser. No. 551,641

Int. Cl.[4] C07F 9/09

U.S. Cl. 260—974 10 Claims

1. A process for preparing triaryl phosphates represented by the formula, $(RO)_3PO$ wherein the R groups are the same or different and are selected from phenyl or alkylphenyl, said alkylphenyl having an alkyl moiety of 3 or 4 carbon atoms, with the proviso that said triarylphosphates have an average mole ratio of alkyl moiety to phenyl group of from about 0.1:1 to about 0.75:1; which process comprises alkylating phenol in a first step to yield an alkylated phenol feedstock, then phosphorylating said phenol feedstock in a second step, wherein the improvement comprises:

(a) heating the alkylated phenol feedstock from the first step to at least 150° C. before contact with phosphorylating agent, with the proviso that any catalyst chosen to assist the alkylation should be either of a kind or amount ineffective as a phosphorylation catalyst,

(b) combining the alkylated phenol feedstock of step (a) with phosphorylating agent in such proportion that the feedstock is in stoichiometric excess,

(c) heating the mixture of alkylated phenol feedstock and phosphorylating agent to a temperature of at least 215° C. until the phosphorylation reaction is essentially completed; and

(d) conducting steps (b) and (c) in the absence of an effective amount of phosphorylation catalyst.

4,559,185

VARIABLE VENTURI TYPE CARBURETOR

Toshiaki Seto; Hideo Yamamoto, and Yoshiji Kobayashi, all of Odawara, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,444

Int. Cl.[4] F02M 9/02

U.S. Cl. 261—41 D 11 Claims

1. A variable venturi type carburetor essentially comprising;

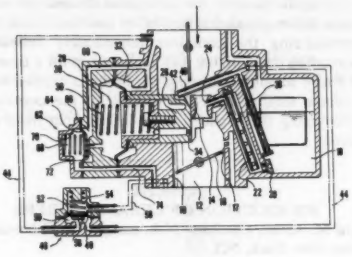
an inner venturi disposed in the intake passage,

an outer venturi wall formed by the intake passage,

a main nozzle adapted to inject main fuel into the inner venturi,

a piston valve disposed as a part of the outer venturi wall, said

piston valve being displaced under the influence of negative pressure in the intake passage, and



an auxiliary fuel nozzle disposed on the outer venturi to feed auxiliary fuel to the outer venturi in response to displacement of the piston valve.

4,559,186

PRODUCTION OF BORATE CROSSLINKED POLYVINYL ALCOHOL CONTACT LENSES

Ping I. Lee, Valley Cottage, N.Y., assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 376,336, May 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 308,742, Oct. 5, 1981, abandoned. This application Jul. 23, 1984, Ser. No. 633,070

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.1 **12 Claims**

1. A process for preparing an optically clear soft contact lens of swollen solid polyvinyl alcohol having a weight average molecular weight of at least about 6,000, crosslinked with a borate in an effective amount to increase the elastic modulus thereof, said lens being substantially insoluble in the tear fluid environment, comprising

(1) blending polyvinyl alcohol having a weight average molecular weight of at least about 6,000 and a sufficient amount of water, at a temperature of between about 50° to 100° C., to convert the blend to a molten liquid mass capable of solidifying to a substantially shape retaining aqueous gel at a temperature below about 50° C.;

(2) transferring said molten mass into a mold cavity having a convex surface and a concave surface corresponding substantially to the configuration of a contact lens;

(3) cooling the mold to below about 50° C. to solidify said molten mass to a substantially shape retaining aqueous gel of polyvinyl alcohol in the form of said contact lens;

(4) removing the substantially shape retaining aqueous gel of polyvinyl alcohol contact lens from the mold;

(5) reacting a borate in an amount sufficient to increase the elastic modulus of the polyvinyl alcohol, with said substantially shape retaining aqueous gel of polyvinyl alcohol lens, in an aqueous medium at a pH above 7 to form a borate-crosslinked polyvinyl alcohol complex contact lens; and

(6) recovering the borate-crosslinked polyvinyl alcohol contact lens.

4,559,187

PRODUCTION OF PARTICULATE OR POWDERED METALS AND ALLOYS

Georges Haour, Geneva; Dag Richter, Carouge, and Willy Wagnieres, Lancy, all of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

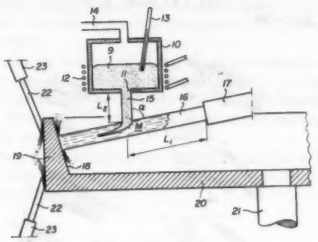
Filed Dec. 14, 1983, Ser. No. 561,363

Int. Cl.[4] B22D *23/08*

U.S. Cl. 264—11 **10 Claims**

1. Method for production of metal or alloy powder wherein a liquid coolant stream intercepts and fractionates a molten metal or alloy stream into molten droplets, the improvement comprising

causing the liquid coolant stream to intercept the metal or alloy stream with such higher volume and velocity that



the molten droplets are entrained in the coolant stream and entirely surrounded thereby until the molten droplets completely solidify or until the molten droplets are further reduced by impacting a target.

4,559,188

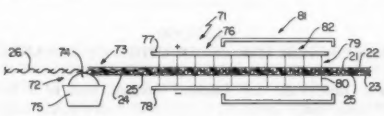
METHOD FOR MAKING A LAYER OF REINFORCED POLYMERIC MATERIAL

Joseph V. Tassone, Kettering, and James T. Candor, Washington Township, Montgomery County, both of Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Feb. 14, 1983, Ser. No. 465,960

Int. Cl.[4] B29D *29/02*

U.S. Cl. 264—24 **6 Claims**



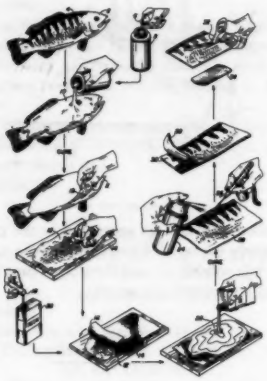
1. In a method of making a substantially flat layer of material having opposed substantially parallel spaced apart flat surfaces and comprising the steps of forming said material to comprise polymeric material and reinforcing particles disposed in said polymeric material by providing a liquid layer of said polymeric material and said reinforcing particles wherein said reinforcing particles are randomly disposed in said liquid layer and said liquid layer has said opposed substantially flat surfaces, orienting the long dimensions of at least a part of the particles thereof relative to said surfaces while said polymeric material is in said liquid layer thereof, and then drying said liquid layer to at least a degree thereof that causes said polymeric material thereof to hold said part of said particles in said oriented condition thereof, the improvement wherein said step of orienting said part of said particles comprises the step of orienting said long dimensions thereof so as to be disposed substantially perpendicular to said surfaces and wherein said step of providing said liquid layer of said polymeric material and said reinforcing particles comprises the step of coating a fabric sheet means with said polymeric material and said reinforcing particles while said polymeric material is in said liquid form thereof whereby said fabric sheet means is disposed in said liquid layer and is substantially between said flat surfaces thereof.

4,559,189

METHOD OF MANUFACTURING SIMULATED ANIMAL OR FISH SKIN

Joseph B. Wegener, II, 4618 W. Fairmont, Phoenix, Ariz. 85031

Filed Feb. 23, 1984, Ser. No. 582,836
Int. Cl.[4] B29C *1/02*
U.S. Cl. 264—39 14 Claims



1. A method of manufacturing simulated skin, comprising:
pouring a silicone compound over a sample of genuine skin to be simulated;
removing the silicone compound from said sample as a layer after it is jelled to produce a mold;
cleaning the mold;
covering the surface of said mold exhibiting the simulated skin surface with a fiberglass cloth;
pouring a flex resin compound through said fiberglass cloth to fill said mold; and
removing the fiberglass cloth leaving said simulated skin.

4,559,190

PROCESS FOR THE PRODUCTION OF EXPANDED RETICULATED POLYETHYLENE

Saverio Quintavalle, and Luciano Gargani, both of S. Donato Milanese, Italy, assignors to AGIP Petroli S.p.A., Rome and Industria Italiana Petroli S.p.A., Genoa, both of, Italy

Filed Oct. 5, 1984, Ser. No. 657,961
Claims priority, application Italy, Oct. 14, 1983, 23300 A/83
Int. Cl.[4] B29J *1/02*
U.S. Cl. 264—45.3 13 Claims

1. Process for the preparation of bodies of expanded cross-linked polyethylene, with closed cells, comprising the steps of:
melting a polymer of ethylene selected among ethylene homopolymers, copolymers of ethylene with alpha-olefins, copolymers of ethylene with conjugated diolefins and relevant mixtures;
homogenizing said polymer of ethylene in the molten state with a quantity of from 0.1 to 2.5% by weight of a cross-linking agent and with a quantity of from 2 to 25% by weight of an expanding agent, said cross-linking agent and expanding agent having a decomposition temperature higher than the melting point of the polymer of ethylene, said homogenizing step operating at temperatures of from 130° to 150° C., and for times of from 5 to 10 minutes;
forming said homogeneous mixture in a solid parallelepiped shape by means of extrusion and subsequent cooling, or by means of moulding wherein the extrusion of moulding step is operated at temperatures within the range of from 130° to 150° C. and for times of from 1 to 10 minutes.
placing the solid parallelepiped shaped body inside an air-tight closed container, pressurizing the container by means of an inert gas, and heating the solid parallelepiped shaped body, at a temperature higher than the decomposition temperature of the cross-linking agent and the expanding agent contained therein, wherein this step is operated at 170°–200° C., under 40–70 bar for 20–45 minutes, in the absence, or substantial absence of expansion, such that expansion is limited to less than about 5%;
depressurizing the container immediately following the foregoing pressurizing and heating step for a time of from 0.5 to 3 minutes, allowing the body to expand to an end volume smaller than the volume of the container, and recovering the expaded cross-linked item from the container.

4,559,191

PRODUCTION OF CERAMIC FIBERS

Richard M. Arons, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,219
Int. Cl.[4] B29C *23/00;* B28B *1/00*
U.S. Cl. 264—60 18 Claims

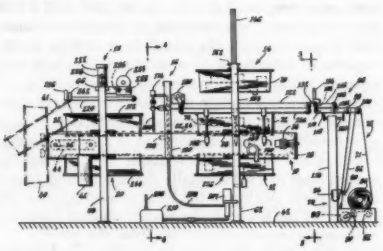
1. A process for the production of a ceramic fiber which comprises (1) providing an organic polymer hollow core fiber which is filled with ceramic powder; (2) submerging the fiber in a fluid medium which is non-permeating and inert to the organic polymer sheath of the filled hollow core fiber, and applying hydrostatic pressure to the fiber to achieve isostatic compacting of the fiber and the ceramic powder filling content; and (3) heating the compacted fiber to pyrolyze the organic polymer content, and sinter the ceramic powder content to form a ceramic fiber.

4,559,192

APPARATUS AND METHOD FOR THE MANUFACTURE OF MOLDED PACKINGS

Michael P. O'Malley, Stratford, Conn., assignor to International Packaging Systems Inc., Norwalk, Conn.

Filed Apr. 1, 1983, Ser. No. 481,318
Int. Cl.[4] B29D *27/04*
U.S. Cl. 264—51 38 Claims

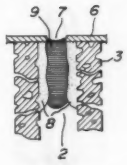


1. A method for manufacturing molded packings comprising:
providing a plurality of open molds;
moving the molds sequentially to a series of work stations in a continuous loop;
delivering a predetermined length of film from a supply roll to the first work station, holding the length of film over the molds at the first work station, cutting the film to the predetermined length to form a sheet, pushing the sheet into the molds, and holding the sheet in position within the molds by applying vacuum to the bottom of the molds;
dispensing a predetermined pattern of foam material into the molds while the molds are moving from the first station to a second work station;
closing the molds to contain the foam material during cure at the second work station; and
ejecting the completed molded packings from the molds by pressure on the molded packings from within the molds.

4,559,193
METHOD OF SEALING OPEN ENDS OF CERAMIC HONEYCOMB STRUCTURAL BODY

Yutaka Ogawa; Shunichi Yamada, both of Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 21, 1983, Ser. No. 487,028
Claims priority, application Japan, Sep. 20, 1982, 57-163514
Int. Cl.[4] B01D *39/20*
U.S. Cl. 264—60 11 Claims

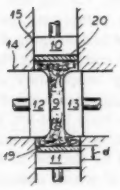


1. A method of sealing open ends of channels in a ceramic honeycomb structural body, comprising the steps of attaching a film on an end surface of a ceramic honeycomb structural body which is to be selectively sealed, said attached film having holes bored at positions corresponding to open ends of channels to be sealed, dipping said end surface having the film attached thereto into a sealing slurry mixture, whereby only an end portion of the ceramic honeycomb structural body is exposed to the slurry, resulting in the slurry adhering to walls of the channels to be sealed, subsequently passing a kneaded pasty sealing material green body into the ends of the channels which have slurry adhering thereto, and firing the ceramic honeycomb structural body, whereby said adhered slurry and said kneaded pasty material seal the selected channels.

4,559,194
PALLET CLEAT AND METHOD OF MAKING SAME

Anton Hegenstaller, Muhlenstr. 9, 8891 Unterbernbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 461,604, Jan. 27, 1983. This application Jun. 13, 1984, Ser. No. 620,056
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3203032; Mar. 11, 1982, 3208875; Jun. 11, 1982, 3222122; Jun. 13, 1983, 3321307
Int. Cl.[4] D04H *1/16*
U.S. Cl. 264—113 8 Claims



1. A method of making an elongated structural member, the method comprising the steps of sequentially:

(a) providing a stiff and relatively incompressible board on a first wall confronting a second wall and defining therewith and with adjacent side walls a compartment;

(b) filling a mass of cellulosic particles and binder into the compartment between the walls;

(c) displacing the first wall with the board toward the second wall and into the compartment into a predetermined intermediate position without substantial movement of the adjacent walls and thereby subjecting the mass in the compartment between the first and second walls to a relatively low compression in a predetermined direction;

(d) displacing at least one of the adjacent walls into the compartment without substantial movement of the first wall and the board from their intermediate position and thereby subjecting the compressed mass in the compartment to a relatively low compression transverse to the direction;

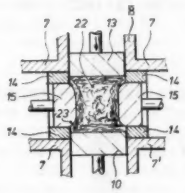
(e) displacing the first wall and the board toward the second wall into a terminal position to subject the mass in the compartment to a relatively high degree of compression in the direction without substantial movement of the side walls; and

(f) curing and hardening the mass between the walls without substantial movement of same and so as to bond the mass to the board.

4,559,195
PRESSED-MATERIAL PALLET CLEAT AND METHOD AND MOLD FOR MAKING SAME

Anton Heggenstaller, Mühlenstr. 9, 8891 Unternbernbach, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,604
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3203032; Mar. 11, 1982, 3208875; Jun. 11, 1982, 3222122; Jul. 20, 1982, 3227074
Int. Cl.[4] D04H *1/16*
U.S. Cl. 264—120 10 Claims



1. In a method of making an elongated press-molded structural member of substantial strength from a mass of cellulosic particles of various lengths admixed with a binder, with the structural member being set into its final hardened state by the application of heat upon completion of the pressing operation; the improvement comprising that, sequentially:

(a) a mass of the particles and binder is randomly filled into a horizontally elongated compartment defined by a pair of elongated and horizontally confronting side walls each having at least a respective portion thereof arranged for horizontal movement toward and away from the corresponding portion of the opposed side wall, an elongated top wall, and an elongated bottom wall confronting the top wall and extending generally parallel to the top and side walls, said top and bottom walls being arranged for vertical movement toward and away from each other, and all said walls during the filling operation being disposed in respective retracted starting positions with reference to the mid-region of the compartment;

(b) the top wall is displaced vertically downwardly toward the bottom wall, and the bottom wall is displaced vertically upwardly toward the top wall, into respective predetermined intermediate positions while the side walls remain stationary in their starting positions, the displacement of the top wall being many times greater than the displacement of the bottom wall so that the mass of particles in the compartment is vertically pre-compressed into the form of an oversized version of the structural member being made and so as to cause the particles engaging the top and bottom walls of the compartment to become generally parallelized with the top and bottom walls;

(c) thereafter, while said top and bottom walls remain sta-

tionary, at least said portions of the side walls are displaced horizontally toward each other between the top and bottom walls into respective inner positions so that the vertically pre-compressed mass of particles in the compartment is horizontally pre-compressed to cause lateral indentations to be formed in the side surfaces of the structural member while the particles engaging the side walls of the compartment are caused to become generally parallelized with said side walls;

(d) thereafter, while the compressive force of the side walls is maintained at its attained value and the side walls remain stationary, and prior to the application of heat, the top and bottom walls are displaced vertically toward each other into terminal positions to further vertically compress the mass of particles in the compartment into the final form of the desired structural member having the desired final dimensions; and

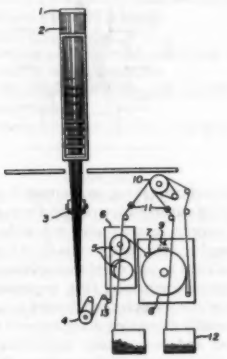
(e) the application of heat to the compressed mass of particles in the compartment is effected without any relaxation of the compressive forces exerted on the mass by the top, side and bottom walls.

4,559,196

PROCESS FOR IMPROVING THE DYEABILITY OF NYLON CARPET FIBER

Henry Kobsa, Greenville, and William T. Windley, Seaford, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1984, Ser. No. 599,409
Int. Cl.[4] D01D *5/22*
U.S. Cl. 264—168 **3 Claims**



1. In a method for producing carpet yarns with improved dyeability by forming filaments of nylon carpet yarn by extrusion of nylon polymer, subjecting the filaments thus formed to bulking or crimping at elevated temperatures and setting said filaments in staple or continuous form with saturated steam, the improvement which comprises forming the filaments from a random copolymer of nylon 66 and about 6–12% by weight of nylon 6 having an amine end content of 30–80 gram equivalents per 1000 kilograms of copolymer and a relative viscosity of 55–85 in filament form and heat setting the filaments with saturated steam at temperatures up to about the melting point of the polymer in saturated steam but not less than about the following temperatures according to their nylon 66 and nylon 6 content:

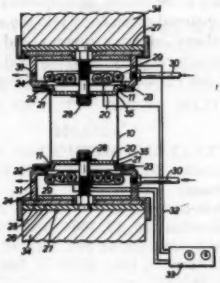
% nylon 66	% nylon 6	Minimum Setting Temperature in Saturated Steam
94	6	139° C.
92	8	132° C.
90	10	122° C.
88	12	110° C.

4,559,197

METHODS AND APPARATUS FOR FLANGING TUBULAR POLYMER ARTICLES

David A. Dick, Wantage, and Glyn Staines, Swindon, both of England, assignors to Metal Box p.l.c., Berkshire, England

Filed Jul. 9, 1984, Ser. No. 628,848
Claims priority, application United Kingdom, Jul. 22, 1983, 8319768
Int. Cl.[4] B29C *65/00*
U.S. Cl. 264—249 **11 Claims**



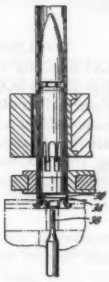
1. A method of flanging a tubular article of a thermoplastic polymer which, following drawing, has been heat-set to an elevated temperature, leaving the material with a residual shrinkage capability, comprising the steps of: applying an end of the tubular article to a flanging die in engagement with the inner surface of the end, heating the said end of the tubular article to a flanging temperature above the glass transition temperature of the polymer but below the elevated temperature to which it has been heat-set, forcing the tubular article and the die together, so that the end of the tubular article is softened and forced by the die to move outwards to form a flange, the material of which undergoes residual shrinkage to establish well defined flange dimensions as the polymer takes up the contours of the die, and then causing the flanged end of the tubular article to cool whilst restrained against deformation to set the flange in accordance with said well defined dimensions.

10. Apparatus for flanging tubular articles of a thermoplastic polymer which, following drawing, has been heat-set to an elevated temperature, comprising: a pair of flanging dies arranged to engage opposite ends of the tubular article for forming an outward flange simultaneously at both ends of the tubular article, means for forcing the dies towards each other, and means for heating and means for cooling the said ends of the tubular article.

4,559,198
METHOD OF MOLDING AN AEROSOL CONTAINER CLOSURE

Robert H. Abplanalp, Bronxville, and Virgil Naku, Hawthorne, both of N.Y., assignors to Precision Valve Corporation, Yonkers, N.Y.

Division of Ser. No. 606,547, May 3, 1984. This application Nov. 29, 1984, Ser. No. 648,750
Int. Cl.[4] B60C *1/00*; B29D *3/02*
U.S. Cl. 264—259 2 Claims



1. The method for the mass production of a gasket-bearing aerosol mounting cup having panel, skirt and channel portions comprising

(a) forming a band of gasket material on the skirt of the mounting cup which extends above the panel of said cup,

(b) initially advancing the band of gasket material onto skirt of the mounting cup at a primary advancing station such that edge of the gasket material distal from the channel of the mounting cup is positioned at or below the periphery of the panel of the mounting cup,

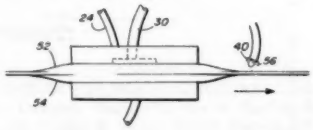
(c) heating the band of gasket material and

(d) advancing the band of gasket material to its ultimate position on the mounting cup and simultaneously imparting a compressive deformation to the gasket material.

4,559,199
APPARATUS AND METHOD FOR FORMING APERTURES IN FILM MATERIALS

Harold A. Jensen, 31 Annadea Rd., Brockton, Mass. 02402

Filed Jun. 13, 1984, Ser. No. 620,009
Int. Cl.[4] B29D *9/04*
U.S. Cl. 264—511 13 Claims



1. A method for sectioning a continuous tubular film which includes:

introducing the film in a flat configuration between two vacuum plates spaced apart from one another;

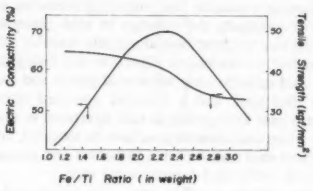
inflating the film to billow the same by introducing an air stream into the film downstream of said plates such that the one ply of the film contacts one vacuum plate and the other ply of the film contacts the other vacuum plate the other vacuum plate having a die; the other ply drawn into engagement with the die said other ply cut substantially simultaneously upon contacting the die thereby forming a section; and

deflating said film whereby it resumes its flat configuration.

4,559,200
HIGH STRENGTH AND HIGH CONDUCTIVITY COPPER ALLOY

Syuichi Yamasaki, Saitama; Hiroshi Yamaguchi, Tokyo, and Yousuke Taniguchi, Saitama, all of Japan, assignors to Mitsui Mining and Smelting Company, Ltd., Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,566
Claims priority, application Japan, Aug. 12, 1983, 58-146635
Int. Cl.[4] C22C *9/00*
U.S. Cl. 420—492 3 Claims

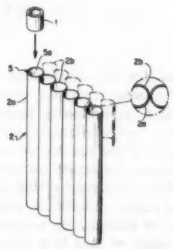


1. A high strength and high conductivity copper alloy comprising 0.05 to 1.0% by weight of Ti, 0.07 to 2.6% by weight of Fe, and one or more members selected from the group consisting of 0.005 to 0.5% by weight of Mg, 0.01 to 0.5% by weight of each of Sb, V, Misch metal, Zr, In, Zn, Sn and Ni, 0.005 to 0.2% by weight of Al and 0.005 to 0.07% by weight of P, and the balance of Cu and wherein the Fe/Ti ratio (by weight) is within the range of 1.7 to 2.3.

4,559,201
CRUCIBLE CASSETTE FOR AUTOMATIC APPARATUS FOR ANALYZING METALS

Takeshi Yamada; Hideki Ohashi, and Masahiro Tanimoto, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Division of Ser. No. 349,664, Feb. 17, 1982, Pat. No. 4,456,580. This application Jan. 23, 1984, Ser. No. 572,890
Claims priority, application Japan, Sep. 17, 1981, 56-148412
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—63 1 Claim



1. A crucible feeding means for use in feeding crucibles to an apparatus for loading feeding crucibles to a combustion furnace for analysis of the contents of the crucible, said apparatus comprising:

a plurality of connected crucible receiving tubes aligned side by said in a substantially straight line and each capable of receiving a plurality of crucibles stacked one above the other, each tube having a bottom and having an engaging member in the bottom thereof for engaging with a lowermost crucible and supporting it in the tube and a guide member for guiding the crucibles in the tube;

a straight elongated cassette case in which said tubes are positioned, said cassette having openings in a top and bottom thereof corresponding to tops and bottoms of said tubes, and having a plurality of notches along the bottom

thereof spaced at distances corresponding to the spacing of the aligned centers of the cross sections of said tubes;

means for moving said cassette case along a line in a direction corresponding to the elongation of said cassette case and having a transfer table extending in said direction having a plurality of apertures therein spaced at distances corresponding to the spacing of the aligned centers of the cross sections of said tubes, a piston-cylinder means having a piston rod reciprocally movable therein through distances corresponding to the spacing between the aligned centers of the cross sections of two adjacent tubes and having a cassette case engaging means on said piston rod for engaging the notches in said cassette case for moving said cassette case along said transfer table as said piston rod moves in one direction and being disengaged from said cassette case when said piston rod moves in its other direction, and a solenoid operated latch on said cassette case engageable in said apertures in said transfer table when said cassette case is to be stopped, and retractable from said transfer table to permit said piston-cylinder means to move said cassette case; and

means for pushing crucibles upwardly out of said tubes and through the openings in the top of said cassette casing one by one and positioned under said transfer table and movable upwardly from under said table through the holes in the bottom of said cassette casing.

4,559,202

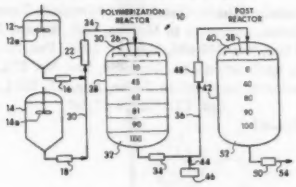
APPARATUS FOR PREPARING POLYMER SOLUTIONS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 466,737, Feb. 16, 1983, Pat. No. 4,508,858. This application Oct. 12, 1984, Ser. No. 660,139

Int. Cl.⁴ C08F *2/10*

U.S. Cl. 422—134 **8 Claims**



1. Apparatus for the continuous preparation of polymer solutions, comprising: reaction mixture forming means for successively and continuously intermixing a polymerizable substance and a polymerization initiator to provide a first reaction mixture; a first reactor vessel in communication with said forming means for receiving each said first reaction mixture from said forming means, said first reactor vessel having an inlet and an outlet; distributor means at the inlet of the first reactor vessel for establishing a plurality of substantially uniform, stable zones of said first reaction mixture in the first reaction vessel as each first reaction mixture from said forming means is continuously introduced therein, each of said zones differing from every other zone in the first reactor vessel in that the polymerization of the polymerizable substance has progressed to a different percentage of completion level in each of the zones; a second reactor vessel in communication with the first reactor vessel, said second reactor vessel having an inlet and an outlet; means for continuously conveying each zone of said first reaction mixture from the outlet of the first reactor vessel to the inlet of the second reactor vessel; a source of a polymer modifying agent upstream of the inlet of the second reactor vessel and in communication with said conveying means for providing a chemical agent, capable of reacting with the polymerized substance, into each of the zones being continuously conveyed from the outlet of the first reactor vessel to the inlet of the second reactor vessel; distributor means at the inlet of the second reactor vessel in communication with said conveying means for establishing a second reaction mixture in the second reactor vessel in which the extent of the completeness of the reaction between the polymerized substance and the chemical agent varies progressively from the inlet to the outlet of the second reaction vessel; and means for conveying the reaction mixture in the second reactor vessel away from the outlet thereof.

4,559,203

LIQUID/LIQUID EXTRACTION OF GALLIUM VALUES FROM BASIC AQUEOUS SOLUTIONS THEREOF

Denisé Bauer, Le Raincy; Patrick Fourré, Paris, and Jean-Louis Sabot, Maisons-Laffite, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Aug. 26, 1983, Ser. No. 526,808

Claims priority, application France, Aug. 26, 1982, 82 14630

Int. Cl.⁴ C01G *15/00*

U.S. Cl. 423—112 **20 Claims**

1. A process for recovering gallium values contained in a basic aqueous solution thereof by liquid/liquid extraction, comprising contacting such basic aqueous solution with a water immiscible organic phase which comprises an organic solvent having dissolved therein an organic-soluble substituted hydroxyquinoline and at least one organic-soluble organophosphorus compound comprising at least one acid function, whereby said gallium values are extracted into the organic phase, separating the organic phase from the basic aqueous solution, and recovering the gallium values from the organic phase.

4,559,204

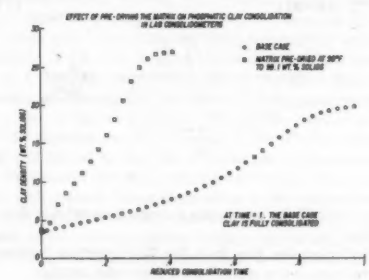
TREATMENT OF PHOSPHATE ORE USED IN PREPARING PHOSPHATE MATRIX SLURRIES

Anil K. Agrawal, Somerset; Stephen W. Saunders, and George J. Weckesser, both of Plainsboro, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 17, 1984, Ser. No. 641,627

Int. Cl.⁴ C01F *1/00*

U.S. Cl. 423—167 **6 Claims**


EFFECT OF PRE-DRYING THE MATRIX ON PHOSPHATIC CLAY CONSOLIDATION IN LAB CONSOLIDOMETERS
BASE CASE
MATRIX PRE-DRIED TO 90% TO 99.1 WT. % SOLIDS
AT TIME = 1, THE BASE CASE CLAY IS FULLY CONSOLIDATED
REDUCED CONSOLIDATION TIME

1. A method of producing a water-based phosphate matrix slurry, comprising:

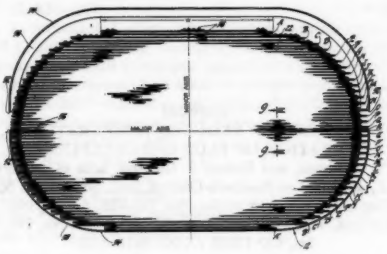
drying an as-mined phosphate matrix to obtain a dried matrix having a solids content of at least 90 weight % and combining the dried phosphate matrix with water to form a slurry having decreased viscosity as compared to a slurry prepared with the as-mined phosphate matrix.

4,559,205

CATALYTIC CONVERTER SUBSTRATE AND RETAINER ASSEMBLY

Paul F. Hood, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1983, Ser. No. 470,159
Int. Cl.⁴ B01J *35/04*
U.S. Cl. 422—180 **2 Claims**



1. A metal foil substrate and retainer for a catalytic converter characterized by a stack of unjoined modules individually formed of a single folded smooth sheet of metal foil and a single folded corrugated sheet of metal foil interleaved in alternate and contacting layers so as to define passages therebetween and wherein each said sheet has a fold along one side and unjoined edges along an opposite side extending longitudinally of the converter along opposite sides thereof with said folded side and unfolded side terminating in end corners and wherein one unjoined edge of each said smooth sheet is located in the fold of the corrugated sheet interleaved therewith and wherein one unjoined edge of each said corrugated sheet is located in the fold of the smooth sheet interleaved therewith, said modules having a uniform thickness but various widths so as to conform said stack to a predetermined cross-sectional curved profile but with the combined thickness of said modules being oversize and compressively loadable to completely conform to said predetermined profile whereby said contacting layers are frictionally held together against relative sliding, and retainer means for forcibly encompassing and thereby compressively loading and retaining said stack in said predetermined profile without penetration or joining thereof and also extending inwardly over the corners of the sheets to engage against the ends of their fold and unjoined edges so as to positively prevent longitudinal movement of the sheets relative to the retainer means.

4,559,206

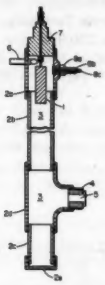
ARC REACTOR FOR FERTILIZER MANUFACTURE

Richard W. Treharne, Xenia; Charlton K. McKibben, Huber Heights, and Donald R. Moles, Yellow Springs, all of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 26, 1984, Ser. No. 664,909
Int. Cl.⁴ C01B *21/32*
U.S. Cl. 422—186.24 **6 Claims**

1. An improved arc reactor device for fixating nitrogen of the type wherein a discharge electrode and electrical ground is provided within a chamber defined by a casing, a voltage is impressed between the discharge electrode and the ground to sustain an arc, the chamber has air inlet and outlet means for injection of air and movement of said air through said arc for the formation of nitrogen oxides, wherein the improvement comprises

a stationary igniter electrode electrically insulated from the casing extending into the chamber proximate to the discharge electrode, said igniter electrode being of smaller surface area than said discharge electrode, and said igniter



electrode being positioned closer to the electrical ground than said discharge electrode.

4,559,207

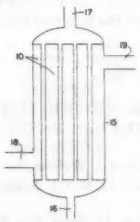
REACTOR FOR PRODUCING METHANOL AND PROCESS

Heinz Hiller, Offenbach; Emil Supp, Dietzenbach; Friedemann Marschner, Weisskirchen; Hans Küpfer, Frankfurt am Main, and Lutz Weidemann, Steinbach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 320,800, Nov. 12, 1981, abandoned, which is a continuation of Ser. No. 726,339, Sep. 24, 1976, abandoned, which is a continuation of Ser. No. 521,821, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 297,141, Oct. 12, 1972, abandoned. This application Nov. 28, 1983, Ser. No. 555,860

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1971, 2153437

Int. Cl.⁴ B01J *8/06, 19/02*
U.S. Cl. 422—197 **1 Claim**



1. In a reactor for producing methanol by the reaction of synthesis gases containing the oxides of carbon and hydrogen, said reactor comprising a plurality of catalyst tubes positioned within a shell containing boiling water under pressure, a synthesis gas inlet communicating with one end of said plurality of catalyst tubes, a product gas outlet communicating with the other end of said plurality of catalyst tubes, a water inlet in said shell, a steam outlet in said shell, and copper-containing catalyst positioned within said catalyst tubes, wherein the improvement comprises

said catalyst tubes being composed of a steel of mixed austenitic-ferritic structure and containing 10–30% by weight chromium.

4,559,208

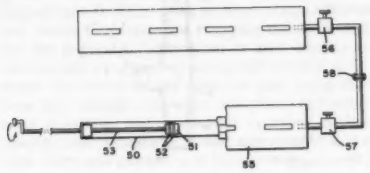
HYDROTHERMAL CRYSTAL GROWING APPARATUS

Bruce H. Chai, Bridgewater; Ernest Buehler, Chatham, and John J. Flynn, Millington, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 230,075, Jan. 30, 1981, Pat. No. 4,382,840. This application Jan. 20, 1983, Ser. No. 459,448

Int. Cl.⁴ C30B *7/10*

U.S. Cl. 422—209 **14 Claims**



1. An apparatus for growing single crystals of alpha-aluminum orthophosphate or alpha-gallium orthophosphate comprising in combination:

(a) a pressure vessel comprising substantially cylindrical walls,

(b) means for suspending a seed crystal in the vessel,

(c) baffle means for dividing the vessel into a plurality of longitudinally-spaced communicating chambers, the baffle means having hole cross-sectional area about 5–20% of that of the baffle.

4,559,209

LEACHING REFRACTORY GOLD ORES

Colin W. A. Muir, Sandton, and Leonard P. Hendriks, Germiston, both of South Africa, assignors to Johannesburg Consolidated Investment Company Limited, Germiston, South Africa

Filed Sep. 6, 1983, Ser. No. 529,587

Claims priority, application South Africa, Oct. 25, 1982, 82/7780

Int. Cl.⁴ C01G *3/00*

U.S. Cl. 423—30 **3 Claims**

1. A method of leaching a gold ore which is refractory due to the presence of sulphide minerals of arsenic and antimony and base metal cyanicides with a cyanide solution and with oxygen addition characterised by the steps of leaching the ore at a pressure of between 2 and 10 MPa and regulating the pH of the solution so that the terminal pH is alkaline and 10 or less than 10.

4,559,210

MULTI-STAGE METHOD FOR WASHING-OUT AMMONIA FROM GAS, PARTICULARLY COKING OVEN GAS

Peter Diemer, and Hans J. Wohner, both of Essen, Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,542

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306664

Int. Cl.⁴ C01C *3/00*; C02F *3/12*; B01D *3/38*

U.S. Cl. 423—237 **5 Claims**

1. In a multi-stage method for washing out amonia from gas, particularly coking oven gas, including the steps of washing out ammonia from gas with water enriched with ammonia in an ammonia washer at at least one wash stage and washing-out ammonia from the gas with ammonia-free water at a final wash stage in the ammonia washer, providing an ammonia still and supplying an ammonia-containing water produced at said at least one wash stage in said ammonia washer to said ammonia still, separating ammonia vapor from waste water in said ammonia still under the action of water steam supplied to said ammonia still, and discharging waste water from said ammonia still, the improvement comprising the steps of branching off a partial stream of waste water from the waste water discharged from said ammonia still and supplying said partial stream directly to said final wash stage of said ammonia washer, said partial stream containing about 100 mg/l of free ammonia, before being supplied to said ammonia washer, being neutralized by the addition thereto of sulfuric acid.

4,559,211

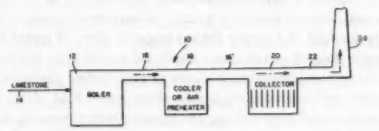
METHOD FOR REDUCED TEMPERATURE OPERATION OF FLUE GAS COLLECTORS

Paul L. Feldman, and Robert J. Gleason, both of Somerville, N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 520,620, Aug. 5, 1983, abandoned. This application Apr. 13, 1984, Ser. No. 599,792

Int. Cl.⁴ C01B *17/00*; B01J *8/00*

U.S. Cl. 423—242 **1 Claim**



1. A method for reduced temperature operation of flue gas particulate collection comprising eliminating sulfur trioxide from hot flue gas by treating the flue gas with an alkali material to thereby lower the acid dewpoint; thereafter cooling the flue gas top about 140° F. to about 250° F. and then subjecting the cooled flue gas to particulate collection, wherein the cooling of the flue gas is accomplished by evaporation of water injected as a spray of very fine droplets less than 50 microns in diameter into the flue gas downstream of the alkali treatment, wherein the alkali material is a finely divided compound selected from the group comprising lime, limestone, dolomite, sodium carbonate, sodium bicarbonate, Trona and Nahcolie and wherein the alkali material is injected as a solution or slurry.

4,559,212

PROCESS FOR PURIFYING GASES CONTAINING SULPHUR DIOXIDE

Olav Erga, Trondheim, Norway, assignor to Sintef, Trondheim, Norway

Filed Sep. 6, 1984, Ser. No. 647,736

Claims priority, application Norway, Sep. 8, 1983, 833211

Int. Cl.⁴ C01B *17/00*

U.S. Cl. 423—243 **2 Claims**

1. A process for removal of sulphur dioxide from exhaust gases by absorption in an aqueous solution containing ions of adipic acid, and stripping of sulphur dioxide with steam, wherein solid adipic acid is added to the absorption solution before or during the steam stripping in such an amount that all the acid is dissolved at the stripping temperature, and after the stripping the solution is cooled to substantially below the absorption temperature to precipitate solid adipic acid which is separated off and is added again after the absorption which takes place with a solution which is unsaturated with adipic acid.

4,559,213
SYNTHESIS OF ZSM-12 ZEOLITE

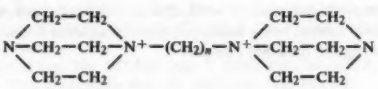
Günter H. Kühl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 490,082, Apr. 29, 1983, Pat. No. 4,482,531. This application Sep. 17, 1984, Ser. No. 651,202
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.⁴ C01B *33/28*
U.S. Cl. 423—329 **7 Claims**

1. A process for preparing a siliceous porous crystalline ZSM-12 zeolite material having the X-ray diffraction pattern of Table II, which comprises preparing a reaction mixture comprised of sources of an alkali or alkaline earth metal, alumina, silica, RN^+ and water, and having the following composition, in terms of mole ratios of oxides:

$OH^-/YO_2 = 0.10$ to 0.40
$RN^+/(RN^+ + M) = 0.2$ to 0.95
$H_2O/OH^- = 20$ to 300
$YO_2/W_2O_3 = 60$ to 5000

wherein Y is silicon or germanium, $(RN)_2^{2+}$ is DABCO-C_n-diquat, having the formula:



wherein n is 4–10, M is an alkali or alkaline earth metal, and W is aluminum or gallium, and maintaining the mixture at crystallization conditions until crystals of said zeolite are formed.

4,559,214
PARTICULATE CALCIUM CARBONATE

Donald K. Howard, Manchester; Michael A. Finan, Macclesfield, and Michael J. Lees, Manchester, all of England, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Feb. 23, 1984, Ser. No. 583,075
Claims priority, application United Kingdom, Feb. 25, 1983, 8305346
Int. Cl.⁴ C01F *5/24, 11/18*
U.S. Cl. 423—430 **7 Claims**

1. A dry particulate calcium carbonate composition, having a particle size in the range of 0.01 μm to 50 μm and having pores within the range of 0.5 nm to 200 nm, which comprises calcium carbonate, and

0.1 to 10% by weight, based on the weight of calcium carbonate, of polymaleic acid or a water-soluble salt thereof, wherein the calcium carbonate is formed by precipitating in the presence of said polymaleic acid or a water-soluble salt thereof.

4,559,215
PRODUCTION OF ANHYDROUS ALUMINUM CHLORIDE FROM HYDRATED ALUMINA

Raouf O. Loutfy, and James C. Withers, both of Tucson, Ariz., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 3, 1983, Ser. No. 519,795
Int. Cl.⁴ C01F *7/58*
U.S. Cl. 423—496 **10 Claims**

1. A process for conversion of hydrated alumina to anhydrous aluminum chloride which consists essentially of:

a. reacting solid hydrated alumina with concentrated hydrochloric acid in a concentration of 15–35% to convert at least a portion of the hydrated alumina directly to an aluminum chloride hexahydrate which spontaneously precipitates as all or part of a solid product;

b. recovering a solid product from said conversion, said product consisting essentially of aluminum chloride hexahydrate or a mixture of aluminum chloride hexahydrate and unreacted hydrated alumina;

c. partially calcining said solid product of step (b) to produce an amorphous mixture of aluminum oxides and oxychlorides with a low content of water and HCl; and

d. chlorinating the mixture of step (c) in the presence of a reductant to form anhydrous aluminum chloride.

4,559,216
METHOD FOR PURIFICATION OF SULFURIC ACID SOLUTION

Tadao Nagai, Hokkaido, and Yoshiaki Echigo, Kyoto, both of Japan, assignors to Unitika Limited, Hyogo, Japan

Filed Mar. 5, 1984, Ser. No. 586,488
Claims priority, application Japan, Mar. 3, 1983, 58-35111
Int. Cl.⁴ C01B *17/90, 28/00;* **B01D** *15/00;* **C02B** *1/44*
U.S. Cl. 423—531 **15 Claims**

1. A method for purification of a sulfuric acid solution entraining a metal ion species selected from the group consisting of antimony ions, bismuth ions, or at least two metal ion species selected from the group consisting of antimony ions, bismuth ions and iron ions, and containing at least 50 g of sulfuric acid per liter, comprising:

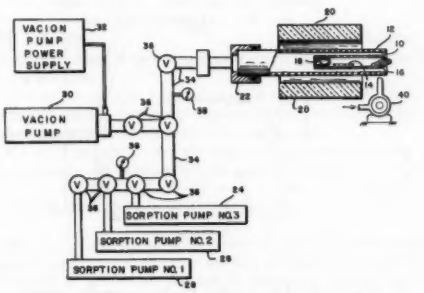
exposing the sulfuric acid solution to a chelating resin possessing a group having methylene-phosphonic acid group substituted for a hydrogen atom or a primary or secondary alkylamino group incorporated as a chelate forming group into a resin matrix to effect adsorption on the chelating resin; and

allowing the chelating resin to separate the metal ion species adsorbed on the chelating resin from the sulfuric acid solution, wherein the metal ion species separated by adsorption on the chelating resin is a metal ion species selected from the group consisting of antimony ions, bismuth ions or at least two metal ion species selected from the group consisting of antimony ions, bismuth ions and iron ions.

4,559,217
METHOD FOR VACUUM BAKING INDIUM IN-SITU

Joseph A. Adamski, Framingham, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 1, 1983, Ser. No. 547,611
Int. Cl.⁴ C01B *25/08*
U.S. Cl. 423—299 **3 Claims**



1. A process for producing highly pure indium for subsequent utilization as a reaction component in the synthesis of highly pure, polycrystalline, indium phosphide which comprises the steps of:

A. placing an indium loaded quartz container within one end of an open, elongated quartz ampoule;

B. placing red phosphorus in the other end of said ampoule;

C. heating said indium loaded quartz container under vacuum to a temperature and for a period of time sufficient to purify said indium while simultaneously cooling under

vacuum said red phosphorus to a temperature below its vaporization point;

D. sealing said quartz ampoule while simultaneously maintaining a vacuum atmosphere within said ampoule; and

E. cooling said sealed ampoule to room temperature.

4,559,218

PROCESS AND APPARATUS FOR PREPARING FINELY-DIVIDED SILICON DIOXIDE HAVING GOOD THIXOTROPIC PROPERTIES

Gösta Flemmert, Agaregatan 38, 269 00 Bastad, Sweden

Continuation of Ser. No. 328,286, Dec. 7, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 575,476

Claims priority, application Sweden, Dec. 12, 1980, 8008768

Int. Cl.⁴ C01B *33/12*

U.S. Cl. 423—336 **7 Claims**

1. A process for preparing finely divided silicon dioxide having high thickening capacity and good thixotropic properties which comprises reacting a silicon fluoride in the vapor phase with water vapor, combustible gas and free oxygen-containing gas to form silicon dioxide and hydrogen fluoride in a flame reaction zone including a burner and a flame whose base extends outwardly from the burner, the reaction zone surrounding the flame including the base of the flame, and at least the portion of the burner at the base of the flame while cooling the gaseous reaction mixture in that portion of the reaction zone surrounding the base of the flame and the portion of the burner at the base of the flame sufficiently to effect a silicon dioxide having a higher degree of agglomeration and a higher thickening number than silicon dioxide prepared as above absent said cooling, by contact with a cooling surface maintained at a temperature below 500° C. but above the dew point of the reaction waste gases generated in the flame reaction.

4,559,219

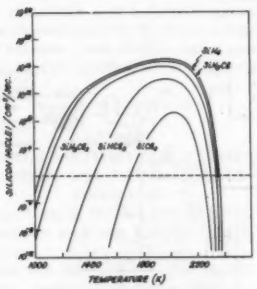
REDUCING POWDER FORMATION IN THE PRODUCTION OF HIGH-PURITY SILICON

Carlyle S. Herrick, Alplaus, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,861

Int. Cl.⁴ C01B *33/02*

U.S. Cl. 423—350 **22 Claims**



1. A method of decreasing the homogeneous nucleation of particulate solid silicon in the gas phase during the pyrolysis of silane homologs and hydrogen mixtures thereof at temperatures below about 1700 Kelvin, said method comprising:

(a) adding halogen to a gaseous feedstock comprised of silane homologs, in the form of one or more members of the group consisting of HI, HBr, HF, Cl_2, Br_2, F_2, I_2, SiX_3H and SiX_4, wherein X is halogen in a quantity at least equi-molar to the silane homolog content of said feedstock, with the quantity of SiX_3H added to the feedstock being limited to less than about 30 mole percent of said feedstock and

(b) pyrolyzing the silane homologs within the feedstock of step (a).

4,559,220

CRYSTALLIZATION OF POLYALUMINIUM HYDROXIDE COMPLEXES

Eric N. F. Kullenberg, Höganäs; Gertrud M. Lindahl, and Lars E. H. Persson, both of Helsingborg, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Nov. 17, 1983, Ser. No. 552,680

Claims priority, application Sweden, Dec. 9, 1982, 8207054

Int. Cl.⁴ C01F *11/46, 7/56*

U.S. Cl. 423—556 **2 Claims**

1. A method for producing a polyaluminium hydroxide complex in solid form, which is soluble in an aqueous solution, comprising admixing an aqueous solution of a polyaluminium hydroxide complex with an organic solvent selected from the group consisting of acetone, methanol, ethanol, n-propanol, isopropanol and tertiary butanol, at least about 0.7 grams of the organic solvent being added per gram of aqueous solution, and isolating the resultant complex.

4,559,221

P-GLYOXYLOYLPHENYLALKANOIC ACID BIS(THIOSEMICARBAZONE) DERIVATIVES, AND THEIR PRODUCTION AND USE

Yasushi Arano, Uji; Yasuhiro Magata, Kyoto, and Akira Yokoyama, Otsu, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

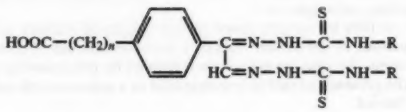
Filed Oct. 7, 1983, Ser. No. 539,884

Claims priority, application Japan, Apr. 19, 1983, 58-68850; Apr. 19, 1983, 58-68851

Int. Cl.⁴ A61K *49/00, 43/00*

U.S. Cl. 424—1.1 **20 Claims**

1. A compound of the formula:



wherein R is a hydrogen atom or a C_1–C_3 alkyl group and n is an integer of 0 to 4.

4,559,222

MATRIX COMPOSITION FOR TRANSDERMAL THERAPEUTIC SYSTEM

David J. Enscore, and Robert M. Gale, both of Mountain View, Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 4, 1983, Ser. No. 491,490

Int. Cl.⁴ A61F *13/00*; A61L *15/03*; A61K *9/70, 31/745*

U.S. Cl. 424—28 **18 Claims**

1. A composition of matter suitable for use as a matrix in a drug delivery system comprising mineral oil, polyisobutylene, a moderately mineral oil soluble drug and at least 6% colloidal silicon dioxide, the MO/PIB ratio being at least 1.0, and being characterized by having a viscosity of at least 1.5×10^7 poise.

4,559,223
SILVER SULFADIAZINE AND/OR ZINC SULFADIAZINE-CONTAINING TOOTHPASTE OR ORAL MEDICAMENT

Charles L. Fox, Jr., New York, N.Y., assignor to Daltex Medical Sciences, Inc., New York, N.Y.

Continuation of Ser. No. 495,734, May 20, 1983, abandoned, which is a continuation of Ser. No. 272,734, Jun. 11, 1981, abandoned, which is a continuation of Ser. No. 132,207, Mar. 12, 1980, abandoned. This application Dec. 6, 1984, Ser. No. 677,905

Int. Cl.[4] A61K *7/16, 9/68, 31/18, 31/315*

U.S. Cl. 424—48 **6 Claims**

1. A method of inhibiting microbial mouth infections and dental caries, plaque formation, gingival destruction and tooth loss associated therewith, which comprises contacting teeth and adjacent gingival surfaces with a composition comprising a suitable carrier and an effective antimicrobial amount of silver and/or zinc sulfadiazine for an effective period of time greater than about 30 seconds to inhibit microbial growth.

4,559,224
TOOTH AND MOUTH CARE AGENT

Helmut Raaf, Schönblick, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Division of Ser. No. 597,849, Apr. 9, 1984, Pat. No. 4,525,343. This application Feb. 20, 1985, Ser. No. 703,426

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314895

Int. Cl.[4] A61K *7/16, 7/22*

U.S. Cl. 424—54 **4 Claims**

1. Tooth and mouth care preparations in the form of toothpaste, mouthwash, mouth spray or tooth powder, containing hesperidin as the essential active ingredient in an amount effective to treat and prevent gingival bleeding.

4,559,225
SUNSCREEN COMPOSITION

Robert G. Fourman, P.O. Box 274, Plainsboro, N.J. 08536

Filed Feb. 16, 1984, Ser. No. 580,748

Int. Cl.[4] A61K *7/42, 7/44*

U.S. Cl. 424—59 **5 Claims**

1. A water-proof sunscreen composition consisting essentially of from 0.1% to 10.0% by weight of cellulose ethyl ether having an ethoxy content of about 43%, from 10.0% to 90.0% ethanol, propanol and isopropanol; from 1.0% to 20.0% by weight of an ultraviolet absorbing sunscreening agent and from 5.0% to 60.0% by weight of an emollient material selected from the group consisting of hydrocarbon oils, hydrocarbon waxes, fatty acid esters of low molecular weight alcohols and volatile silicone fluids.

4,559,226
SELF-EMULSIFYING ALKOXYLATE ESTERS

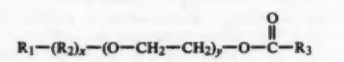
Arnold W. Fogel, Park Ridge, and Ronald J. Smith, Upper Montclair, both of N.J., assignors to Bernel Chemical Company Inc., Tenafly and Heterene Chemical Company, Inc., Paterson, both of, N.J.

Filed Sep. 6, 1983, Ser. No. 529,750

Int. Cl.[4] A61K *7/34, 7/38;* **C07C** *69/22, 69/767*

U.S. Cl. 424—66 **30 Claims**

1. A self-emulsifying alkoxylate ester having a structural formula:



wherein:

R_1 contains from 2 to 20 carbon atoms and is selected from the group consisting of aliphatic and aromatic substituents;

R_3 is an alkyl or aryl substituent from 1 to 21 carbon atoms; one of R_1 and R_3 must contain greater than 8 carbon atoms;

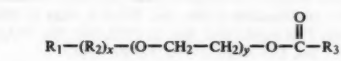
R_2 is:

x is from 1 to 10;

y is from 1 to 20; and

the ratio of y to x is from 2:1 to 10:1.

9. A method of preventing chalking of a liquid dispersion antiperspirant composition containing volatile silicone oil, comprising adding to the antiperspirant composition a chalk preventative amount of a self-emulsifying alokoxylate ester having the structural formula:

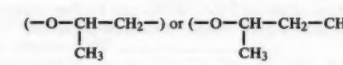


wherein:

R_1 contains from 2 to 20 carbon atoms and is selected from the group consisting of aliphatic and aromatic substituents;

R_3 is an alkyl or aryl substituent from 1 to 21 carbon atoms; one of R_1 and R_3 must contain greater than 8 carbon atoms;

R_2 is:



x is from 1 to 10;

y is from 1 to 20; and

the ratio of y to x is from 2:1 to 10:1.

4,559,227
CONDITIONING SHAMPOO CONTAINING AMINE FUNCTIONAL POLYDIORGANOSILOXANE

Grish Chandra; Gretchen S. Kohl, both of Midland, Mich., and James A. Tassoff, West Caldwell, N.J., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 31, 1984, Ser. No. 666,849

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 **30 Claims**

1. A conditioning shampoo composition comprising, in the form of a solution,

(A) 0.1 to 10 percent by weight of a nonionic surfactant selected from the group consisting of fatty acid alkanolamide surfactants and amine oxide surfactants,

(B) 0.1 to 10 percent by weight of an amine functional siloxane polymer represented by the general formula

$$R_{3-z}'Q_zSiO[R_2'SiO]_x[R'QSiO]_ySiQ_zR_{3-z}'$$

wherein R′ denotes an alkyl group of 1 to 4 carbons or a phenyl group, with the proviso that at least 50 percent of the total R′ groups are methyl; Q denotes an amine functional substituent of the formula —R″Z, wherein R″ denotes a divalent alkylene radical of 3 to 6 carbon atoms or a radical of the formula $—CH_2CH_2CH_2OCH_2CHOHCH_2—$ and Z denotes a monovalent radical selected from the group consisting of $—NR_2'''$, $—NR'''(CH_2)_nNR_2'''$, and

wherein R'''' denotes hydrogen or an alkyl group of 1 to 4 carbons, R''''' denotes an alkyl group of 1 to 4 carbons, and n is a positive integer from 2 to 6; z has a value of 0 or 1; x has an average value of 25 to 1000; y has an average value of 0 to 100 when z is 1, y has an average value of 1 to 100 when z is 0; with the proviso that in all cases y has an average value that is not greater than one tenth the average value of x; and

(C) 3 to 30 percent by weight of a detersive surfactant selected from the group consisting of anionic surfactants and amphoteric surfactants,

(D) 50 to 96.7 percent by weight of water.

4,559,228

COMPOSITION AND METHOD FOR THE TREATMENT OF CANCER

Daniel M. de la Torre, Isabel la Catolica No. 271, Colonia Obrera, Mexico 8, D.F., Mexico

Continuation of Ser. No. 360,540, Mar. 22, 1982, abandoned, which is a continuation of Ser. No. 145,419, May 1, 1980, abandoned. This application Apr. 2, 1985, Ser. No. 719,621

Int. Cl.[4] A61K *39/00, 35/30, 33/42*

U.S. Cl. 424—85 **6 Claims**

1. A method of treating adenocarcinoma in human patients which comprises administering to a patient a daily dose of from 0.5 to 10 mg/mg of said adenocarcinoma of an iodine sterilized suspension of finely divided brain tissue derived from a bovine or equine animal for a period of time of from 45 to 60 days, wherein the 45 to 60 day administration cycle is alternated with the administration of a daily dosage of gamma-globulin in an amount sufficient to protect against viral infection for a period of time of about 2 to 3 weeks and further comprising administration of a daily dosage of calcium phosphate.

4,559,229

AVIAN PROVENTRICULITIS VACCINE

Robert K. Page, Winder; Pedro Villegas, Athens; Caswell S. Eidson, Athens, and Daniel Gaudry, Athens, all of Ga., assignors to Research Foundation, Athens, Ga.

Filed Jul. 20, 1982, Ser. No. 400,024

Int. Cl.[4] A61K *39/12;* **C12N** *7/00*

U.S. Cl. 424—89 **12 Claims**

1. A vaccine capable of protecting poultry against proventriculitis, which comprises:

an antigenic material capable of inducing in said poultry an immune response against avian proventriculitis reovirus, wherein said antigenic material is selected from the group consisting of live, attenuated, and inactivated proventriculitis reovirus and immunologically active subcomponents thereof, wherein said reovirus has the identifying characteristics of ATCC No. VR2040 or a progeny thereof, and

a pharmacologically acceptable carrier.

4,559,230

PROTEIN PRODUCT, PROCESS FOR MAKING IT AND PHARMACEUTICAL COMPOSITION CONTAINING SAID PROTEIN

Bernard David, Villiers sur Marne; Gabriel Peltre, and Salah Mecheri, both of Paris, all of France, assignors to Institut Pasteur, Paris, France

Filed Mar. 23, 1983, Ser. No. 478,108

Claims priority, application France, Mar. 26, 1982, 82 05241

Int. Cl.[4] A61K *39/36, 39/00, 45/02, 37/00*

U.S. Cl. 424—91 **20 Claims**

1. A glycoprotein having a molecular weight of about 14,000 daltons and an isoelectric point of about 4.6; a 1 mg/ml aqueous solution of said glycoprotein having an absorption of $\epsilon=0.12$ units of optical density at 280 nm; said glycoprotein being isolated by a process comprising:

(a) admixing pollen of Dactylis glomerata with an aqueous medium, thereby extracting water-soluble products;

(b) separating the aqueous extract from insoluble matter;

(c) subjecting said aqueous extract to fractionation by molecular weight and isolectric point; and

(d) isolating said glycoprotein.

4,559,231

PROCESS FOR INCREASING THE CAPACITY OF SYSTEMS FOR MEMBRANE FILTRATION OF MILK OR MILK PRODUCTS

Poul Bjerre, Silkeborg, and Ernst Büchbjerg, Videbaek, both of Denmark, assignors to Pasilac A/S, Silkeborg, Denmark

Filed May 19, 1983, Ser. No. 496,301

Claims priority, application Denmark, Oct. 21, 1982, 4677/82

Int. Cl.[4] A23C *9/12, 1/00*

U.S. Cl. 426—42 **16 Claims**

1. In a process for increasing the capacity of membrane filtration systems for milk or milk products, whereby prior to the membrane filtration, the milk or the milk product is normally subjected to one or more of the following pre-treatment steps:

(a) heat treatment for bacteriological reasons,

(b) fat standardization in view of the fat content of the product,

(c) homogenization in view of the desired physical and organoleptic properties of the end product, and

(d) pre-acidulation in order to influence the solubility of the ash components of the milk,

the improved process comprising subjecting said milk or milk product, prior to the membrane filtration, to a further pretreatment in the form of an enzymatic treatment with curdling enzyme under agitation of the milk or milk product to form an integrated dispersion of a coagel in whey.

4,559,232

PROCESS FOR MAKING PARTICLE EMBEDDED FOOD PRODUCTS

Jerome J. Glantz, Tualatin, and Michael G. Doenges, Newberg, both of Oreg., assignors to Lamb-Weston, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 457,911, Jan. 14, 1983, Pat. No. 4,456,624. This application Jun. 21, 1984, Ser. No. 622,788

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.[4] A23L *1/212, 1/216*

U.S. Cl. 426—96 **13 Claims**

1. A method of applying a particulate media to the outer surface of a potato product, the method comprising the steps of:

preheating the product at least slightly to soften its outer surface; and then

impinging food particles carried in a fluid stream against the product at a velocity sufficient to embed the particles in an outer surface layer of the product by disrupting the outer surface layer without destroying the structural integrity of the product.

4,559,233

EDIBLE FIBROUS SERUM MILK PROTEIN/XANTHAN GUM COMPLEXES

Wen-Sherng Chen, Glenview, and William G. Soucie, Gurnee, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

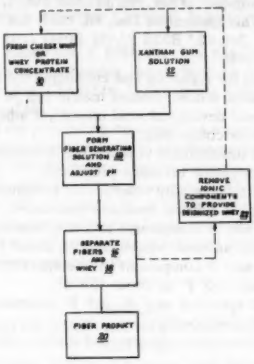
Filed Dec. 30, 1983, Ser. No. 567,277

Int. Cl.[4] A23J *3/00*

U.S. Cl. 426—104 **11 Claims**

1. A method for manufacturing edible protein fibers comprising the steps of providing an aqueous protein fiber generating solution comprising a solubilized edible protein component comprising at least about 20 weight percent of dairy whey protein based on the total weight of solubilized protein, and a solubilized xanthan gum hydrocolloid component selected from the group consisting of xanthan gum, xanthan gas/hydrocolloid adducts and mixtures thereof, the weight ratio of

said xanthan gum to said protein component being in the range of from about 1:4 to about 1:10, and wherein the total weight of said solubilized edible protein component and said solubilized xanthan gum hydrocolloid component is in the range of from about 0.1 to about 4 weight percent, based on the total


FRESH CHEESE WHEY OR WHEY PROTEIN CONCENTRATE
XANTHAN GUM SOLUTION
FORM FIBER GENERATING SOLUTION AND ADJUST pH
REMOVE IONIC COMPONENTS TO PROVIDE DESIRED WHEY
SEPARATE FIBERS AND WHEY
FIBER PRODUCT

weight of said aqueous protein fiber generating solution, adjusting the pH of the fiber generating solution to the isoelectric point of a xanthan-protein complex while mixing said fiber generating solution to provide xanthan-protein fibers and a whey solution, and separating the fibers from the whey solution.

4,559,234

MEAT CURING COMPOSITIONS AND METHOD OF USE

Leon J. Rubin; Levente L. Diosady; Fereidoon Shahidi, all of Toronto, and Darrell F. Wood, Nepean, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 30, 1984, Ser. No. 615,117
Int. Cl.⁴ A23B *4/14*; A23L *1/31*
U.S. Cl. 426—250 **16 Claims**

1. A composition for curing meat comprising dinitrosyl ferrohemochrome, at least one antioxidant agent, at least one sequestering agent and at least one antimicrobial agent.

4,559,235

LOW TEMPERATURE DEHYDRATED ALFALFA PRODUCT AND METHOD AND APPARATUS FOR PROCESSING SAME

John T. Miller, Roll, Ariz., assignor to Miller Dehydrator International, Inc., Roll, Ariz.

Filed May 20, 1982, Ser. No. 380,147
Int. Cl.⁴ A23K *1/00*
U.S. Cl. 426—636 **6 Claims**

1. A method of operating a dehydrating system to dehydrate freshly chopped alfalfa, said method consisting essentially of the steps of:

(a) conveying fresh chopped alfalfa through a dryer shed on a plurality of porous conveyor belts;

(b) transferring alfalfa from a downstream end of one conveyor belt to an upstream end of the next conveyor belt;

(c) heating a plurality of separate adjacent dry air streams to a plurality of predetermined temperatures and passing the heated dry air streams simultaneously upwardly through adjacent portions of said porous conveyor belts and the alfalfa thereon at a plurality of adjacent predetermined regions in the dryer shed whereby the heated air streams pass through said porous belt and the alfalfa thereon before passing through an upstream portion of the alfalfa;

(d) causing fast drying portions of alfalfa leaf pieces that become separated from the rest of the alfalfa to fall downward through the porous conveyor belts into a separate conveyor region which is outside of the path of the air streams;

(e) removing the separated fast drying leaf pieces from the dryer separately from the alfalfa on the conveyor belts;

(f) moving alfalfa from the dryer shed into a plurality of pairs of rollers, and operating the rollers to apply shear forces sufficient to crush the alfalfa stems and to fracture and shatter the alfalfa leaves, into minute leaf pieces that are much smaller than substantially all of the stem pieces;

(g) passing the alfalfa material into a screen separating device; and

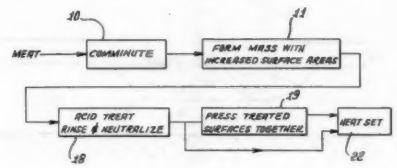
(h) operating the screen separating device to separate the minute leaf pieces from the crushed alfalfa stems thereby providing an alfalfa leaf product consisting of minute alfalfa leaf pieces having high levels of protein, carotene, and xanthophylls and low fiber content.

4,559,236

METHOD OF PREPARING FABRICATED MEAT PRODUCTS

Minoru Okada, Tokyo, Japan, assignor to Suzuhiro U.S.A., Inc., Los Angeles, Calif.

Continuation of Ser. No. 451,478, Dec. 20, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 662,081
Int. Cl.⁴ A23L *1/325*
U.S. Cl. 426—643 **6 Claims**



1. In the method of processing fish paste to form a fish product, the steps comprising:

(a) forming a coherent mass of the fish paste to have increased exposed elongated surface areas in the form of elongated strands extending in side-by-side relation,

(b) treating only said surface areas with an acid solution for a time interval between 10 and 120 seconds, to denature the fish paste, the acid solution having a concentration between 0.05 and 0.5 mols and consisting of an aqueous solution wherein the acid is selected from the group consisting of acetic, lactic, citric, glutamic, succinic, fumaric, maleic, hydrochloric and phosphoric,

(c) rinsing said acid treated surface areas with water and substantially neutralizing said surface areas by contacting said surface areas with an aqueous alkaline solution wherein the alkali is selected from the group consisting of sodium bicarbonate, sodium carbonate and trisodium phosphate,

(d) deforming the mass to press together said elongated surface areas and distribute them substantially uniformly throughout the mass, and then

(e) heating the thus deformed mass at between 70° C. and 90° C. for 5–60 minutes.

4,559,237

PROCESS FOR THE DEPOSITION OF METALS ON SEMICONDUCTOR POWDERS

Kurt Meier, Allschwil; Niklaus Bähler, Rheinfelden, and Jean-Francois Reber, Riehen, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 456,888, Jan. 10, 1983, abandoned. This application Oct. 30, 1984, Ser. No. 666,127

Claims priority, application Switzerland, Jan. 15, 1982, 241/82

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—53.1 10 Claims

1. A process for the deposition of gold, silver, palladium or mixtures thereof on a semiconductor oxide powder selected from the group consisting of TiO_2, WO_3, SnO_2, $SrTiO_3$, Fe_2O_3, Nb_2O_5, Ta_2O_5, $KTaO_3$, ZrO_2, ZnO, $CaTiO_3$, $BaTiO_3$, $FeTiO_3$, Fe_2TiO_4, Fe_2TiO_5, $YFeO_3$ and $KTa_{0.77}Nb_{0.23}O_3$, which process comprises

irradiating a suspension of said semiconductor powder in an open system, in the presence of oxygen, CO_2 or mixtures thereof of an oxidizable medium, which protects the semiconductor from photocorrosion, and of a gold, silver or palladium salt or complex, or mixture thereof.

4,559,238

METHOD OF MAKING A FIELD EFFECT TRANSISTOR WITH MODIFIED SCHOTTKY BARRIER DEPLETION REGION

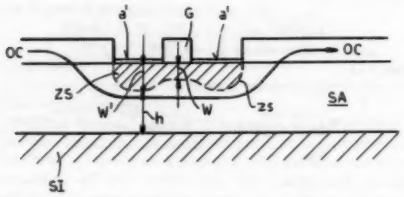
Marina Bujatti, and Antonio Cetronio, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jul. 19, 1982, Ser. No. 399,739

Claims priority, application Italy, Jul. 20, 1981, 48933 A/81

Int. Cl.[4] H01L *29/56*

U.S. Cl. 427—82 4 Claims



1. A method of making a field effective transistor with a modified metal semiconductor Schottky barrier depletion zone which comprises:

forming a GaAs active semiconductor layer upon a semi-insulating substrate and applying to a surface of said active layer opposite said substrate, a pair of spaced apart ohmic contacts and a barrier electrode forming a gate between said ohmic contacts and at the same level thereof, whereby an electron depletion region is formed below said surface between said ohmic contacts and beneath said electrode; and

modifying the depth of said region so that the depth of said region between said ohmic contacts and said electrode differs from the depth of said region below said electrode by at least one of the steps of:

subjecting the surface below said barrier electrode prior to the application of said barrier electrode to said surface to an ion bombardment in nitrogen gas for a period of substantially 1 to 2 minutes at an intensity of up to about 100 watts, and

depositing a gallium oxide on said surface between said electrode and said ohmic contacts.

4,559,239

METHOD FOR REPAIRING CEMENTITIOUS SUBSTRATE

Louis F. Cenegy, 25411 Teton Way, El Toro, Calif. 92630

Continuation-in-part of Ser. No. 505,232, Jun. 17, 1983, which is a continuation-in-part of Ser. No. 344,504, Feb. 1, 1982, Pat. No. 4,507,336. This application Dec. 16, 1983, Ser. No. 562,161

Int. Cl.[4] B32B *35/00;* B05D *1/02*

U.S. Cl. 427—140 3 Claims

1. A method for repairing and enhancing the durability of a concrete conduit whose cement matrix has at least partially deteriorated and developed void interstices among the aggregate constituents comprising:

providing a substantially volatile-free A component containing an isocyanate urethane precursor,

providing a substantially volatile-free B component containing polyol and amine urethane precursors,

preheating said A component to a temperature in the range from about ambient temperature to about 140° F.,

preheating said B component to a temperature in the range from about 110° F. to about 150° F.,

mixing and spraying said A and B components onto the surface of said conduit,

filling said interstices adjacent said surface with said components,

reacting said A and B components to form a tough polyurethane matrix in said interstices and an exterior layer adhering to said surface in a very fast gel time ranging up to about 12 seconds.

4,559,240

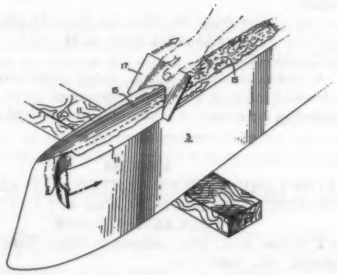
METHOD FOR REPAIRING FIBERGLASS BOAT HULLS

Kenneth Herbert, Jr., 2894 Pringle St., Stark Industrial Park, Charleston, S.C. 29405

Continuation of Ser. No. 554,573, Nov. 23, 1983, abandoned. This application Feb. 26, 1985, Ser. No. 705,619

Int. Cl.[4] B32B *35/00*

U.S. Cl. 427—140 6 Claims



1. A method for repairing, resurfacing and/or finishing a fiberglass boat hull which has become worn, damaged or abraided, consisting of:

(a) preparing said hull for repairing, resurfacing and/or finishing by masking said hull along the length of said hull on each side of an area to be repaired, resurfaced or finished, while leaving said area exposed;

(b) applying a quantity of prepared epoxy material along the length of said hull so as to cover said area and so that excess epoxy material is present;

(c) preparing a template from a sheet of material by forming a void in said template which duplicates the shape of said hull;

(d) distributing and finishing said epoxy material by pulling said template from one end of the length of said hull to the opposite end of said hull in one manual stroke while applying pressure to said template so as to smooth and shape said epoxy;

(e) removing said masking material; and

(f) allowing said epoxy material to set.

4,559,241

METHOD FOR PREVENTING HARDENED CEMENTITIOUS MATERIAL FROM DETERIORATING

Masamichi Obitsu, and Takahiro Hori, both of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,237
Claims priority, application Japan, Nov. 11, 1983, 58-212953
Int. Cl.⁴ B32B *35/00*; B05D *3/02*
U.S. Cl. 427—140 **13 Claims**

1. Method for preventing cementitious material from deteriorating and concurrently metallic armatures embedded therein from rusting, comprising applying an aqueous solution of 5–20 weight % of a lithium silicate having a SiO_2/Li_2O molar ratio of 2.2–4 and 0.01–5 weight % of lithium nitrite on the outer surface of said cementitious material, impregnating the outer surface layer of said cementitious material with said solution, and then drying said solution.

4,559,242

METHOD OF PREPARING COLOR DEVELOPER SHEETS

Hirofumi Mitsuo; Shojiro Watanabe, and Keiso Saeki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1984, Ser. No. 582,499
Claims priority, application Japan, Feb. 23, 1983, 58-28926
Int. Cl.⁴ B41M *5/16, 5/22*
U.S. Cl. 427—150 **12 Claims**

1. A method of preparing a color developer sheet for pressure-sensitive recording, comprising:

preparing a Coating Solution A by dissolving an aromatic carboxylic acid metal salt in an organic solvent and emulsifying the resulting solution in water;

preparing a Coating Solution B by mechanically dispersing an aromatic carboxylic acid metal salt in an aqueous system;

mixing the Coating Solution A and the Coating Solution B such that the weight ratio of the amount of the aromatic carboxylic acid metal salt in Coating Solution A to that of the aromatic carboxylic acid metal salt in Coating Solution B is in the range of from 10:90 to 90:10; and

coating the resulting mixture on a support base.

4,559,243

ABSORBENT PLANAR STRUCTURE AND METHOD OF ITS MANUFACTURE

Michel Pässler, Neusäss, and Bruno Reisch, Augsburg, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,350
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140784
Int. Cl.⁴ B05D *1/00*
U.S. Cl. 427—209 **15 Claims**

1. A method for the manufacture of a pore permeated absorbent, planar structure resembling natural sponge comprising:

(a) preparing a fiber mixture in the form of an aqueous suspension;

(b) mixing a foamable, heat-coaguable latex mixture with said fiber suspension;

(c) foaming said mixture by the introduction of a gaseous medium;

(d) applying said foamed mixture to one or both sides of a substrate;

(e) coagulating the fiber-containing latex foam by the application of heat to provide an open-pore structure; and, as the next step of said process;

(f) stabilizing said open-pore structure by drying and vulcanizing or curing to provide said pore-permeated absorbent structure.

4,559,244

COMPOSITE REFRACTORY FOAMS

Martin R. Kasprzyk, Ransomville, and Monika O. TenEyck, Lewiston, both of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 584,198, Feb. 27, 1984, abandoned, and a continuation of Ser. No. 502,285, Jun. 8, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,864
Int. Cl.⁴ D03D *3/00*
U.S. Cl. 427—227 **32 Claims**

1. A composite refractory foam devoid of organic polymeric material, comprising a first particulated refractory material, open cellularly and interconnectingly arranged, having a second refractory material having a lower melting temperature than the first refractory material, melt infiltrated between at least a portion of the particles of first particulated material.

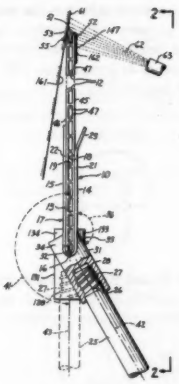
12. A process for the preparation of a composite refractory foam comprising impregnating an organic foam material with a fluid slurry of a first refractory material, drying, applying thereto a second refractory material having a lower melting point than the first refractory material, heating the thus treated foam material for a time and to a temperature sufficient to decompose the organic foam which heating is to at least the melting point of the second refractory material but less than that of the first refractory material and infiltrating said first refractory material with said second refractory material.

4,559,245

PAINT SHIELD HOLDER AND SHIELDING METHOD

William C. Stark, 306 S. Almansor St., Alhambra, Calif. 91801

Filed Aug. 25, 1983, Ser. No. 526,500
Int. Cl.⁴ B05D *1/32*
U.S. Cl. 427—282 **30 Claims**



25. A method of painting a surface, comprising the steps of:

providing a paint shield by interconnecting a pair of planar sheets with a multitude of mutually spaced webs;

providing said paint shield with a bifurcated edge portion by cutting said planar sheets along a line spaced from one of said webs interconnecting said planar sheets so that edge portions of said planar sheets project separately beyond said one web along thereof;

holding said paint shield adjacent said surface; and

spraying paint past said bifurcated edge portion to said surface thereby shielding against said spraying paint with said held paint shield an area adjacent said surface being painted and preventing with said bifurcated edge portions of the planar sheets a migration of paint over said edge portion of said paint shield to said area.

4,559,246
METHOD OF INCREASING THE WETTABILITY OF A SURFACE BY A MOLTEN METAL

William R. Jones, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 20, 1985, Ser. No. 703,532
Claims priority, application United Kingdom, Apr. 5, 1984, 8408754
Int. Cl.[4] B05D *3/00*
U.S. Cl. 427—299 13 Claims

1. A method of treating a surface so as to increase its wettability comprising the steps of:

coating said surface with an oxide selected from the group consisting of molybdenum trioxide, chromic oxide, ferric oxide and nickel oxide; and subsequently bringing said coated surface into intimate contact with molten magnesium or an alloy thereof under conditions inhibiting oxidation of said molten magnesium or alloy thereof.

4,559,247
LACTONE GRAFTED POLYETHERS IN COATINGS FOR DEFORMABLE SUBSTRATES

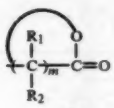
Peter W. Kopf, Belle Mead, and Charles N. Merriam, Martinsville, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 20, 1983, Ser. No. 534,070
Int. Cl.[4] B05D *3/02;* B32B *27/38;* C08G *59/16*
U.S. Cl. 427—386 15 Claims

1. In a coating composition comprising a binder for deformable substrates the improvement wherein said binder is a high molecular weight polymer which is the product of reacting, to completion in the presence of a catalyst, (a) in the presence of a solvent at or just below the reflux temperature, or (b) in the absence of a solvent at at least about 100° C.:

(1) a lactone of the formula:

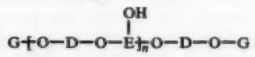
(I)



wherein each R_1 and R_2 is individually hydrogen or lower alkyl, and m is from 3 to about 12; and

(2) a hydroxyalkoxy phenoxy polyether having the average formula:

(II)



wherein D is the residue of a dihydroxy aromatic hydrocarbon, E—OH is the hydroxy residue of an epoxide, G is either hydrogen or the residue of a capped or uncapped epoxide; and n is sufficient to provide a weight average molecular weight of at least about 30,000, to form a graft copolymer wherein the polyether is substantially free of 1,2-epoxy groups.

14. A process for producing a coated, deformed article which comprises:

(1) coating a deformable article with a coating composition containing a binder of claim 1;

(2) drying said coated article; and

(3) deforming said article.

4,559,248
SLIDING MEMBER

Kikuo Sumiyoshi, Fujisawa, and Kingo Miyasaka, Ayase, both of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

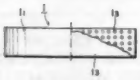
Filed Oct. 26, 1983, Ser. No. 545,503
Claims priority, application Japan, Nov. 12, 1982, 57-197708
Int. Cl.[4] F16C *27/02;* F16J *15/12*
U.S. Cl. 428—36 4 Claims

1. A sliding member comprising: at least one heat resistant material selected from the group consisting of expanded graphite, mica, ceramic and asbestos; a reinforcing material in the form of either a combination of a metal mesh and a mesh made by weaving or knitting metal fine wires and fluoroplastic yarns together, or a mesh made by weaving or knitting metal fine wires and fluoroplastic yarns together, whereby said heat resistant material and said reinforcing material are integrally shaped so that at least on the sliding surface of said sliding member are exposed said fine metal wires and said fluoroplastic yarns, both constituting said reinforcing material, and said heat resistant material being retained by said mesh as well as filling the voids formed between said metal fine wires in a mutually intermingled state of heat resistant material and metal fine wires, and providing substantially a smooth surface.

4,559,249
SLIDING MEMBER AND A METHOD FOR MANUFACTURING THE SAME

Hideto Arigaya, Tanashi; Yoshihiro Katsui, Wako; Kikuo Sumiyoshi; Eiji Sato, both of Fujisawa, and Kingo Miyasaka, Ayase, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Oiles Industry Co., Ltd., both of Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,932
Claims priority, application Japan, Nov. 5, 1982, 57-193395
Int. Cl.[4] F16C *27/02;* F16J *15/12*
U.S. Cl. 428—36 13 Claims



1. A sliding member comprising a base body made of a firmly entangled and collapsed woven or knitted metal mesh formed of metal fine wires which are provided with voids formed between said metal fine wires, said voids being compactly filled with a heat resistant material, the sliding surface on the outer periphery of said base body being formed into a smooth surface with either a lubricant that fills a number of small holes formed in said heat resistant material as well as covering the surface thereof or with said lubricant and said metal fine wires being exposed on the outer periphery of said base body.

5. A method for manufacturing a sliding member comprising the steps of:

(a) preparing a metal mesh as a reinforcing material in a band-like or cylindrical sleeve form by weaving or knitting metal fine wires;

(b) preparing a sheet-like heat resistant material having a definite thickness and formed with a number of small holes in the thickness thereof at given intervals;

(c) applying on one of the surfaces of said sheet-like heat resistant material a lubricant in a given thickness and simultaneously filling said small holes of the same;

(d) positioning said sheet-like heat resistant material applied

with said lubricant on said metal mesh so as to result in a band-like laminate;

(e) forming either a rectangular preform by laying said laminate on a pile of other similarly prepared band-like laminates so that said lubricant is directed towards the sliding surface, said other laminates each comprising another metal mesh with heat resistant material applied thereon, or a cylindrical preform by convoluting said band-like laminate itself around a suitable cylindrical material;

(f) introducing said rectangular or cylindrical preform into a metal die, the cavity of which corresponds to the shape and dimension of a final product; and

(g) applying pressure to said preform in the direction of said lamination or the axis of said convolution to compress and shape said preform into the final product.

4,559,250

CONTAMINATION-CONTROL MATS

Raymond J. Paige, 61 The Point, Coronado, Calif. 92118

Filed Mar. 21, 1984, Ser. No. 591,678

Int. Cl.⁴ A61F *13/02*

U.S. Cl. 428—40 **10 Claims**

1. A tacky mat stack employing a stacked series of sheets of either high-density polyethylene or linear low-density polyethylene or non-linear low density polyethylene each sheet having been treated electronically on both sides, and adhesive coated on its upper side, said upper side having about twice the dyne level of electronic treatment of the lower, non-adhesive coated side, to provide preferential action that enables trouble-free sheet separation during removal of each uppermost sheet from said stack while also avoiding loss of the adhesive coating from the sheets below and preventing premature delamination of said stack.

4,559,251

MATERIAL FOR ACCIDENT PROTECTING CLOTHES WITH CONNECTED TILE-LIKE SMALL NYLON PLATES

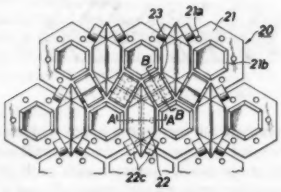
Kaoru Wachi, 1-13-4, Kamifukuoka, Kamifukuoka-shi, Saitama-ken, Japan

Filed Feb. 14, 1985, Ser. No. 701,374

Claims priority, application Japan, Feb. 17, 1984, 59-21418[U]; Oct. 9, 1984, 59-152948[U]

Int. Cl.⁴ F41H *1/02*

U.S. Cl. 428—53 **2 Claims**



1. A material for accident protecting clothes characterized in that tile-like small plate pieces made of nylon series resin are connected and formed, beneath a layer of bulletproof fiber sheets stacked in number as required, into a flexible plate-like configuration by connectors, soft rubber is placed beneath the flexible plate, a few sheets of bulletproof fiber sheets are attached beneath the soft rubber, and the whole structure is integrally coated wth a water-resisting synthetic resin sheet.

4,559,252

PLATE METAL REINFORCING COMBINATION

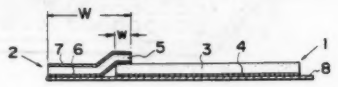
Masanori Motoda, Toyota; Atsunobu Fujikawa, Okazaki; Shigeki Shuzuki, Nagoya; Junpei Suzuki, Chiryu, and Masahiro Nojima, Tokyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nihon Tokushu Toryo Co., Ltd., both of, Japan

Filed Jun. 8, 1984, Ser. No. 618,954

Claims priority, application Japan, Jun. 9, 1983, 58-103372; Jun. 9, 1983, 58-103373

Int. Cl.⁴ B32B *27/12, 11/00*

U.S. Cl. 428—57 **9 Claims**



1. A reinforcing assembly for use with plate metal comprising

a pressure-sensitive adhesive sheet formed from a sheet-like substrate comprising asphalt, rubber, and a filler and having a pressure-sensitive adhesive layer on one surface thereof, and

a thermosetting sheet formed from a sheet-like substrate comprising polyvinyl acetal, monomeric diallyl phthalate, a filler, and at least one additive, and having a reinforcing fiber layer on one surface and a pressure-sensitive adhesive layer on the other surface thereof,

wherein said thermosetting sheet at one edge partially overlaps said pressure-sensitive adhesive sheet with the pressure-sensitive adhesive layer of the former in contact with that surface of the latter which is remote from its own pressure-sensitive adhesive layer.

4,559,253

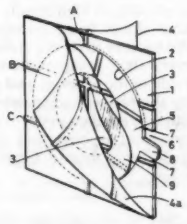
FOLDABLE COMPOSITE PANEL INCLUDING MEANS FOR RENDERING IT RIGID

Daniel J. Thallinger, 2 rue Albert de Mun, 92190 Meudon Bellevue, France

Filed Jul. 17, 1984, Ser. No. 630,960

Int. Cl.⁴ G09F *11/04*

U.S. Cl. 428—65 **10 Claims**



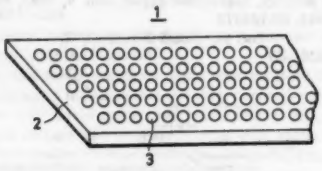
1. A foldable composite panel comprising a rigid core plate defining a circular central opening, a rigid rotary disc plate having a circular disc shape matching with and nested in said circular opening, said core plate and said rotary plae being provided with a plurality of corresponding rectilinear hinge means, and flexible cover sheets between which both said core plate and rotary plate are sandwiched, said rotary plate being angularly movable in relation to said core plate between a first position in which said hinge means of said core and rotary plates are in alignment, and a second position in which said hinge means are out of alignment.

4,559,254

RESIN MATERIAL IN SHEET FORM

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Company Ltd., Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,674
Int. Cl.⁴ B32B *3/24*
U.S. Cl. 428—131 **10 Claims**



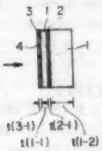
1. A dielectric comprising a sheet of continuously porous polytetrafluoroethylene material having, in addition to the pores of the porous material, a multiplicity of holes formed therethrough.

4,559,255

ACOUSTICAL ABSORBING MATERIAL

Shinichi Shimode, and Shigenori Sato, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,113
Claims priority, application Japan, Dec. 26, 1983, 58-243950
Int. Cl.⁴ B32B *3/10, 5/32*
U.S. Cl. 428—138 **7 Claims**



1. An acoustical absorbing multilayered material exhibiting improved acoustical absorbing performance over a wide frequency range comprising:

a plurality of porous sheets and a plurality of high density sheets; said plurality of high density sheets and said plurality of porous sheets being arranged alternately one in contact with another to form a multilayered material with a high density sheet being exposed and arranged on an outermost side of the material, said porous sheets and said high density sheet being held together in intimate alternate contact with one another, and

at least the outermost exposed sheet of said plurality of high density sheets being formed therein with a plurality of through-holes.

4,559,256

IMAGE RECEIVING TRANSPARENT BASE FILM

Fumio Matsumoto, No. 1-25-54 Nishinogawa, Komae-shi, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,103
Int. Cl.⁴ B32B *3/10*
U.S. Cl. 428—141 **1 Claim**

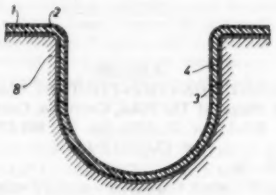
1. A thin transparent flexible base film of polyester writing material having a thickness of about 25±5μ, having one surface roughened by sand-blasting to a roughness of about 5–6μ, and having on said roughened surface a film layer about 2–3μ thick of a rubber material selected from styrene-butadiene rubber, natural rubber, butadiene rubber (BR), isoprene rubber (IR), chloroprene rubber (CR), isobutylene-isoprene rubber (IIR), acrylonitrile-butadiene rubber (NBR), ethylene-propylene-diene rubber (EPDR) and acrylic rubber, said roughened and coated surface being capable of receiving a written or printed image.

4,559,257

LAMINATE TOGETHER WITH A METHOD FOR ITS MANUFACTURE

Erling I. Nilsson, Åkarp, Sweden, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Continuation of Ser. No. 458,941, Jan. 18, 1983. This application Aug. 9, 1984, Ser. No. 639,538
Claims priority, application Sweden, Jan. 20, 1982, 8200290
Int. Cl.⁴ B32B *1/02, 3/28, 15/08*
U.S. Cl. 428—152 **7 Claims**



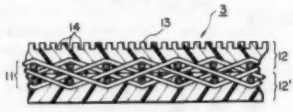
1. A packing material laminate for use in manufacturing packing containers, comprising: a polyester layer; a first glycol-modified polyester layer bound to a first side of said polyester layer; a metal foil layer bound to a second side of said polyester layer; and a second glycol modified polyester layer bound to the free surface of said metal foil layer, said metal foil layer being wrinkled and thereby being able to be expanded, without tearing, when the laminate is stretched upon formation of a packing container from the laminate.

4,559,258

PRESSURE BELT FOR USE WITH EXTENDED NIP PRESS IN PAPER MAKING MACHINE

Masao Kiuchi, Kamagaya, Japan, assignor to Ichikawa Woolen Textile Co., Ltd., Japan

Filed Sep. 30, 1983, Ser. No. 537,575
Claims priority, application Japan, Oct. 1, 1982, 57-147931[U]
Int. Cl.⁴ B32B *3/00*
U.S. Cl. 428—156 **4 Claims**

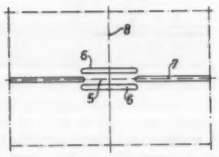


1. In a pressure belt for use with a paper making machine including an extended nip press having a press roll and a pressure shoe which are in surface contact with each other, said pressure belt travelling between said press roll and a pressure shoe and being forced towards the press roll by the pressure shoe so that a felt and a web of paper to be dewatered and carried on the felt are squeezed in the nip, said pressure belt characterized by comprising an endless base fabric formed of a synthetic fiber filament, and formed with a synthetic resin layer on each outer and inner side thereof, said outer side being provided with a number of drain channels on the surface of said outer side, said channels providing drainage without permitting leakage through the belt.

4,559,259
PACKING LAMINATE PROVIDED WITH CREASE LINES

Renato Cetrelli, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Oct. 6, 1980, Ser. No. 194,342
Claims priority, application Sweden, Oct. 18, 1979, 7908645
Int. Cl.[4] B26D *3/08*; B32B *3/30*; B65D *5/42*
U.S. Cl. 428—167 3 Claims



1. A packing laminate for conversion into packing containers, said laminate comprising a crease line which during the shaping of the packing container forms a first folding line in the laminate, said crease line having an interruption where the crease line is replaced by two auxiliary crease lines running in the main direction of the crease line, the interruption in the crease line being of a length which is 20 to 80 times the thickness of the laminate, one of said auxiliary crease lines being arranged on each side of the first folding line, said auxiliary crease lines being mutually parallel and located symmetrically in relation to the folding line, the distance between each auxiliary crease line and the folding line is between 3 and 15 times the thickness of the laminate, the folding line after folding extends between said auxiliary crease lines without coinciding with any portion of the auxiliary crease lines, and the area of the packing laminate between the auxiliary crease lines being at least partially delaminated.

4,559,260
IMAGE HOLDING MEMBER HAVING PROTECTIVE LAYERS

Masaaki Hirooka, Toride; Hitoshi Toma, Kawasaki, and Hideyo Kondo, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

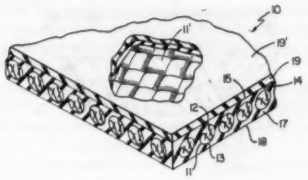
Continuation of Ser. No. 251,089, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 81,463, Oct. 3, 1979, abandoned. This application Nov. 30, 1982, Ser. No. 445,477
Claims priority, application Japan, Oct. 14, 1978, 53-126700
Int. Cl.[4] B32B *7/00*; G03G *5/14*
U.S. Cl. 428—215 7 Claims

1. An image holding member for holding electrostatic images or toner images which comprises at least a support and, at the surface, a three-layered insulating layer comprising an upper layer mainly composed of an organic solvent-soluble thermoplastic resin having a linear molecular structure, an intermediate layer having a thickness of from 1 to 35 microns and being mainly composed of an organic solvent-soluble thermoplastic resin and a cured thermosetting resin, wherein the ratio by weight of said thermoplastic resin to said thermosetting resin is from 8:2 to 2:8 and wherein said thermoplastic resin and said cured thermosetting resin are mutually soluble in each other, and a lower layer mainly composed of a cured thermosetting resin.

4,559,261
POLYMERIC-COATED FABRIC LAYER

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 482,364, Apr. 5, 1983, Pat. No. 4,474,834.
This application Jul. 25, 1984, Ser. No. 634,323
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—246 8 Claims



1. In a polymeric product having a surface and a polymeric-coated fabric layer means provided with opposed surfaces one of which is secured to said surface of said product by a previous heat curing together of said product and said layer means and the other of which is a contact face for said product, said fabric layer means comprising a fabric layer having opposed sides and two substantially continuous layers of polymeric material secured in stacked relation to one of said sides of said fabric layer by the intermediate polymeric layer first being coated in liquid form onto the fabric layer and when the intermediate layer has been substantially dried without curing thereof the outer polymeric layer is then coated in liquid form onto the intermediate polymeric layer and then substantially dried without curing said polymeric layers whereby the outer layer of polymeric material defines said one surface of said layer means, the improvement wherein only the intermediate polymeric layer of said two polymeric layers had a slip agent therein before said heat curing and which during said heat curing together of said product and said layer means migrated through said outer polymeric layer to the outer surface thereof to provide a degree of reduction in the surface coefficient of friction for said contact face of said product, the slip agent having been contained in said intermediate layer at the time the same was coated in liquid form onto said one side of said fabric layer.

4,559,262
FIBRE REINFORCED COMPOSITIONS AND METHODS FOR PRODUCING SUCH COMPOSITIONS

Frederic N. Cogswell, Welwyn Garden City; David J. Hezzell, Biggleswade, and Peter J. Williams, Barton-le-Clay, all of England, assignors to Imperial Chemical Industries, PLC, London, England

Continuation of Ser. No. 341,186, Jan. 20, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,713
Claims priority, application United Kingdom, Jan. 21, 1981, 8101821; Jul. 28, 1981, 8123160; Nov. 17, 1981, 8134597
Int. Cl.[4] B32B *5/08*, *31/00*
U.S. Cl. 428—294 3 Claims

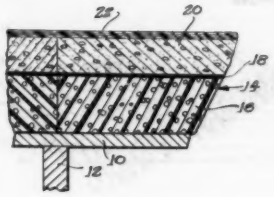
1. A thermoformable, fibre reinforced structure comprising a thermoplastic polymer and at least 30% by volume of parallel aligned reinforcing filaments having a diameter up to 24 microns said filaments having been wetted by the said polymer in a continuous melt pultrusion process so as to give a longitudinal flexural modulus determined by ASTM D790-80 of at least 70% of the theoretical attainable flexural modulus.

4,559,263

CEMENT-FOAM COMPOSITE BOARD

David L. Roodvoets, Westville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1985, Ser. No. 700,844
Int. Cl.[4] B32B 5/18, 5/32, 13/12
U.S. Cl. 428—312.4 7 Claims



1. A prefabricated cement-foam composite board comprising an insulating panel of closed cell foam plastic resin, and a layer of lightweight concrete bonded thereto, said concrete being foamed and including Portland cement and a lightweight aggregate.

4,559,264

SYNTHETIC MICA PRODUCTS

Syed N. Hoda, Horseheads, and Anthony R. Olszewski, Bath, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,566
Int. Cl.[4] B32B 19/00, 27/38
U.S. Cl. 428—324 17 Claims

1. A substrate in which a plurality of synthetic mica papers impregnated with an organic resin are laminated together to produce a planar isotropic coefficient of thermal expansion in the X-Y plane, each paper being composed of overlapping, ion-exchanged platelets of a synthetic, lithium and/or sodium, water-swelling mica wherein lithium and/or sodium ions from the mica have been exchanged for larger cations, said mica platelets having a high aspect ratio and a planar orientation.

4,559,265

MAGNETIC RECORDING MEDIUM

Yuichi Kubota; Masaharu Nishimatsu, both of Komoro, and Shigeru Shimada, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 567,953
Claims priority, application Japan, Jan. 6, 1983, 58-581
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—336 9 Claims

1. A magentic recording medium, produced by preparing a resin solution for magnetic paint having as a main component thereof a copolymer of (A) vinyl chloride, (B) a vinyl carboxylate, (C) an unsaturated carboxylic acid and (D) an unsaturated carboxylic anhydride, containing 50 to 80% by weight of (A) based on the total of the amounts of (A) and (B), 60 to 90% by weight of (D) based on the total of the amounts of (C) and (D), and 1 to 5 parts by weight of the total of (C) and (D) based on 100 parts by weight of the total of (A) and (B) and having an average polymerization degree of 100 to 400, mixing 10 to 80% by weight of said resin solution with 90 to 20% by weight of a radiation- sensitive curing resin, blending the resultant mixture as a main component with a magnetic powder, applying the resultant magnetic paint to a non-magnetic substrate, and solidifying the applied layer of paint with radiation.

4,559,266

LAMINATED MATERIALS FOR THERMOFORMING INTO FOOD PACKAGING

Mitsugu Misasa, Kisarazu, and Ryoichi Hirayama, Matsudo, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,010
Claims priority, application Japan, Jun. 7, 1982, 57-96105
Int. Cl.[4] B32B 27/08, 27/30, 27/32
U.S. Cl. 428—341 30 Claims

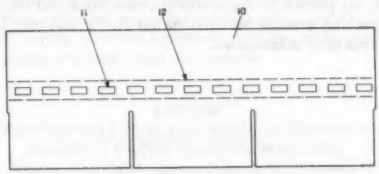
1. A laminated material for thermoforming into food packaging comprising sequentially, a first inner layer consisting essentially of polyolefin, a second gas barrier layer consisting essentially of a polymer material selected from the group consisting of a saponified product of an ethylene-vinyl acetate copolymer, a polyamide resin, and a polyester resin, a third layer consisting essentially of a vacuum deposited metal and a fourth outer layer consisting essentially of a transparent thermoplastic resin.

4,559,267

STICK-DOWN SYSTEM FOR ROOFING

John G. Freshwater, Ennis, and Alfred B. Malmquist, Dallas, both of Tex., assignors to Elk Corporation, Ennis, Tex.

Filed Sep. 21, 1983, Ser. No. 534,190
Int. Cl.[4] B32B 13/04
U.S. Cl. 428—352 13 Claims



1. A roofing membrane having superposed on at least one surface:

(a) a compounded bitumen sealant consisting essentially of untreated roofer's flux and from about 3% to 20% by weight of rubbers, thermoplastic resins, and mixtures thereof, wherein said compounded bitumen exhibits high tackiness at ambient temperature and is adhesive to an adjacent asphalt shingle; and

(b) a release sheet having a release substance selected from the group consisting of silicone resins, fluorine-containing resins and polyvinylidene chloride;

wherein said sealant is superposed at one or more positions on one area of said membrane and said release sheet is superposed on another area of said membrane.

4,559,268

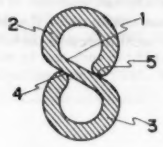
FILAMENT FOR BRUSHMAKING

Hiroyuki Nakashima, Takasago; Atuyoshi Tamura; Yoichi Kanbara, both of Kakogawa, and Masaharu Fujii, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1984, Ser. No. 626,798
Claims priority, application Japan, Jul. 4, 1983, 58-121933
Int. Cl.[4] D02G 3/00; A46B 13/20
U.S. Cl. 428—397 7 Claims

1. A filament for brushmaking made of a thermoplastic polymer and having a plurality of cavities or hollow structures,

a lateral cross section of the filament having at least two end sections and a middle section, each of said end portions being bent in a continuous curve so as to meet and contact said



middle section thereby defining said cavities or hollow structures, and the cross-sectional area of said cavities or hollow structures being 20 to 60% of the cross-sectional area of the filament.

4,559,269

COMPOSITE PUFFED BORAX PARTICLES

Sidney C. Beach, Parma, and Gary W. Loar, Strongsville, both of Ohio, assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Apr. 13, 1984, Ser. No. 600,117
Int. Cl.⁴ B32B *9/04, 19/04*
U.S. Cl. 428—403 **10 Claims**

1. A composite particle comprising a matrix of puffed borax having a porous surface and a bulk density ranging from about 2 to about 44 pounds per cubic foot, with said matrix having directly adsorbed on the porous surface thereof a plurality of individual grains of a metal oxide.

4,559,270

OXIDATION PROHIBITIVE COATINGS FOR CARBONACEOUS ARTICLES

Raymond V. Sara, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 28, 1983, Ser. No. 518,194
Int. Cl.⁴ B05D *3/02;* **B32B** *9/00*
U.S. Cl. 428—408 **27 Claims**

1. An article comprising a carbonaceous substrate having a coefficient of thermal expansion greater than about 1.5×10^{-6} inch/inch/° C. and an oxidation prohibitive coating overlying and bonded to said substrate, said coating comprising a rigid, glossy, ceramic, refractory material containing mullite as a major ingredient along with a metallic carbide selected from the group consisting of silicon carbide and boron carbide and mixtures thereof.

4,559,271

THERMOFORMABLE SILICONE RESIN COATING COMPOSITION AND DUAL COMPONENT COATING SYSTEM FOR POLYCARBONATE

James E. Doin, Hoosick Falls, and Howard A. Vaughn, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 415,457, Sep. 7, 1982, Pat. No. 4,477,499. This application Jul. 27, 1984, Ser. No. 635,301
Int. Cl.⁴ C08G *77/00;* **B32B** *27/36, 27/30;* **B05D** *3/06*
U.S. Cl. 428—412 **21 Claims**

1. A thermoformable coated article comprising a polycarbonate substrate having at least one surface coated with (i) a layer of a thermally dried primer composition comprising about 0.5 to about 10 parts by weight of a thermoplastic acrylic polymer in about 99.5 to about 90 parts by weight of a volatile solvent, and (ii) a layer of a cured top coat comprising a colloidal silica filled thermoset polysiloxane containing a silylated ultraviolet radiation screening compound and a small amount of Lewis acid compound.

4,559,272

HEAT CURABLE POLYGLYCIDYL AROMATIC AMINE ENCAPSULANTS

Susan L. Oldham, Long Beach, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 9, 1984, Ser. No. 608,615
Int. Cl.⁴ B05D *5/12;* **C08G** *59/28*
U.S. Cl. 428—418 **9 Claims**

1. A method for encapsulating an electrical component to provide resistance to corona discharge at electrical stresses of about 2100 volts per mil or more in said component comprising:

(a) impregnating said component with a low viscosity, heat curable composition comprising an uncured polyglycidyl aromatic amine, a polycarboxylic acid anhydride curing agent, and a chosen curing accelerator; and

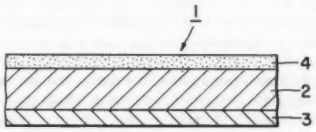
(b) curing said composition to form an encapsulating layer on said component, said layer being capable of withstanding electric stress of at least 2100 volts per mil.

4,559,273

HEAT TRANSFER SHEET

Masaki Kutsukake, Tokyo; Mineo Yamauchi, Ichikawa, and Masanori Akada, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Feb. 28, 1985, Ser. No. 706,757
Claims priority, application Japan, Mar. 2, 1984, 59-39884; Oct. 18, 1984, 59-219183
Int. Cl.⁴ B41M *5/26*
U.S. Cl. 428—484 **10 Claims**



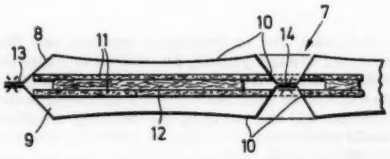
1. A heat transfer sheet comprising a heat transfer layer provided on one surface of a base sheet, and a heat-resistant protective layer provided on the other surface of said base sheet, said heat-resistant protective layer containing (a) polyvinyl butyral, (b) an isocyanate, and (c) a compound selected from the group consisting of phosphoric esters, its alkali metal and alkalie earth metal salts, and mixtures thereof.

4,559,274

COMPOSITE COMPONENTS OF SANDWICH CONSTRUCTION

Herbert Kloppe, Pulheim; Erwin Spiegel, Bergheim, and Hans Vogt, Overath, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 18, 1983, Ser. No. 485,986
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215616
Int. Cl.⁴ B32B *5/20;* **B29C** *67/22*
U.S. Cl. 428—594 **14 Claims**



1. A method of producing composite components of sand-

wich construction, comprising the steps of assembling two shells, each in the form of a prefabricated metal sheet to define a cavity, and two plate-shaped parts of foamable synthetic material with a resilient central layer of a soft compressible material between them in the cavity, joining the two shells at their edges, and subjecting the resulting assembly to a heat treatment of a duration of approximately 10 minutes at a temperature of approximately 200° centigrade.

4,559,275

PERFORATED PLATE FOR EVENING OUT THE VELOCITY DISTRIBUTION

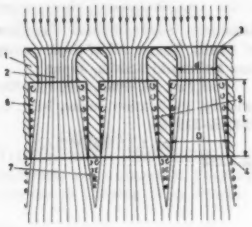
Bernhard Matt, Rickenbach/Bergalingen, Fed. Rep. of Germany; Theo Woringer, and Gerassime Zouzoulas, both of Zurich, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 20, 1983, Ser. No. 505,845

Claims priority, application Switzerland, Jun. 23, 1982, 3835/82

Int. Cl.⁴ B32B *3/10*

U.S. Cl. 428—596 **6 Claims**



1. In a perforated plate for evening out the velocity distribution in a flow channel of the type in which the plate is provided with a plurality of passage holes, the improvement wherein the passage holes are widened stepwise in the flow channel direction of flow so that the holes form shock diffusers arranged in parallel, said plate having a rotationally symmetrical arrangement of the holes, spacings and diameters of the holes being sized such that local area ratios of blocked flow cross-section to free flow cross-section on inflow and outflow sides of the perforated plate are constant over the entire cross-sectional flow area of the flow channel.

4,559,276

CONCRETE REINFORCING STEEL FIBERS

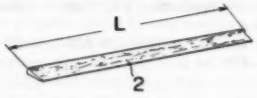
Yoshitomo Tezuka, Hachioji, Japan, assignor to Aida Engineering Ltd., Sagamihara, Japan

Filed Jun. 7, 1982, Ser. No. 385,916

Claims priority, application Japan, Mar. 3, 1982, 57-3328

Int. Cl.⁴ C04B *31/18*

U.S. Cl. 428—599 **5 Claims**



1. A steel fiber for reinforcing concrete, said fiber being produced by directly cutting a steel block by means of a rotary cutting machine having a plurality of cutting edges, the axial direction of the steel fiber being at a right angle to the cutting direction, said fiber satisfying the following conditions:

L=20 to 40 mm,

N=W/t=7 to 9,

W=1.5 to 2.5 mm, and

t=0.2 to 0.3 mm;

wherein:

L is the length of the fiber,

N is the flatness index,

W is the width of the fiber in a cross section normal to the axial direction thereof, and

t is the maximum thickness of the fiber in a cross section normal to the axial direction thereof.

4,559,277

CERAMIC AND ALUMINUM ALLOY COMPOSITE

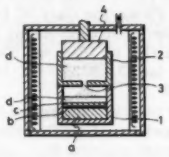
Masaya Ito, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 8, 1984, Ser. No. 618,692

Claims priority, application Japan, Jun. 17, 1983, 58-107648

Int. Cl.⁴ H01P *21/88*; H05K *1/05*

U.S. Cl. 428—627 **6 Claims**



1. A ceramic-aluminum alloy composite comprising an integral combination of a ceramic element, a metallized layer, a cladding layer and an aluminum alloy layer, said metallized layer and said cladding layer being sequentially formed on a surface of said ceramic element, said aluminum alloy layer being formed adjacent said cladding layer by pouring and solidification of a molten aluminum alloy, wherein said cladding layer comprises a three-layer laminated structure having top and bottom layers each of a material selected from the group consisting of Cu, Ag and Al and an intermediate layer of a metal dissimilar from the metal of said top and bottom layers.

4,559,278

ELECTROLYTICALLY RHENIUM COATED MOLYBDENUM CURRENT INLET CONDUCTOR ASSEMBLY FOR VACUUM LAMPS

János Nagy; László Nagy, and Endre Oldal, all of Budapest, Hungary, assignors to Tungsram Reszvenytarsasag Abr. Tungsram Rt., Budapest, Hungary

PCT No. PCT/HU83/00002, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO83/02684, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 27, 1983, Ser. No. 541,337

Claims priority, application Hungary, Jan. 28, 1982, 254

Int. Cl.⁴ H01J *17/16*; C23C *5/00*; C25D *5/00*

U.S. Cl. 428—630 **6 Claims**

1. A current inlet conductor assembly, particularly for vacuum devices, especially for light sources such as incandescent lamps or discharge tubes, consisting of an inlet conductor made of molybdenum for passing electric current and being surrounded by a vitreous silica material forming a hermetic seal therewith and an intermediate electrolytically deposited rhenium coating of a thickness of 3 to 1000 nm covering the surface of said molybdenum at least on the portions to be welded and wetted by the vitreous silica material.

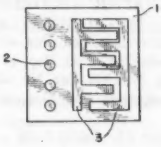
4,559,279
ELECTRODE ON HEAT-RESISTING AND ISOLATING SUBSTRATE

Katsuhiko Honjo, Takatsuki; Hiromitsu Taki, and Noriya Sato, both of Miyazaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 509,594, Jun. 30, 1983, Pat. No. 4,510,179, which is a continuation of Ser. No. 293,981, Aug. 18, 1981, abandoned. This application Feb. 1, 1985, Ser. No. 697,893

Int. Cl.⁴ C23C *3/00, 3/02*

U.S. Cl. 428—632 **8 Claims**



1. An electrode on a heat-resisting and isolating substrate, which electrode comprises:

a metallic particle layer of 0.2 to 1 micron in thickness comprising 5 to 60 weight % of a silver component, and 95 to 40 weight % of a base metal component containing at least one member selected from the group consisting of nickel, copper, aluminum, zinc, tin, iron and cobalt; and

an electroless plating layer of nickel or copper of 0.5 to 20 microns in thickness;

whereby said base metal component improves the adhesive force and electrical characteristics including dielectric constant and δ of said electrode, and prevents migration of said silver component thereby to improve the useful life of said electrode under humid conditions.

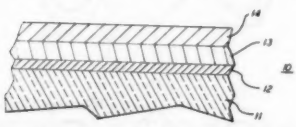
4,559,280
METALLIZED RARE EARTH GARNET AND METAL SEAL TO SAME

Robert L. Bronnes, Irvington, N.Y.; James K. McKinlay, Ridgefield, Conn.; Richard C. Sweet, North Tarrytown, and Walter K. Zwicker, Scarborough, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 18, 1984, Ser. No. 682,965

Int. Cl.⁴ B32B *15/04*

U.S. Cl. 428—633 **6 Claims**



1. A garnet-to-metal seal comprising: a garnet body having a surface at least partially metallized by a first sputter deposited layer of a reactive metal, a second sputter deposited layer of a refractory metal, and a third sputter deposited layer of a solderable layer; a metal member to be bonded; and a solder layer between the third sputter layer and the metal member.

4,559,281
COATING FOR A SURFACE SUBJECT TO EXPOSURE TO A HIGH-FREQUENCY FIELD TO PREVENT INTERFERENCE RESULTING FROM SECONDARY ELECTRON EMISSION

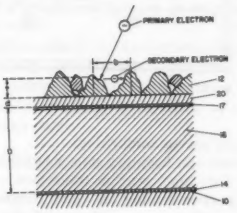
Heinrich Derfler, Munich; Jurgen Perchermeier, and Hermann Spitzer, both of Garching, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,050

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247268

Int. Cl.⁴ B32B *15/14*

U.S. Cl. 428—687 **12 Claims**



1. An electrically conductive coating for the surface of a base member which in operation is exposed to high frequency fields, said coating preventing interference resulting from secondary electron emission and comprising an outer layer having a rough surface and a thickness less than the skin depth penetration of the coating at said high frequencies and a further layer of high electrical conductivity between the outer layer and the base member and having a thickness substantially greater than the skin depth penetration of said coating at said high frequencies.

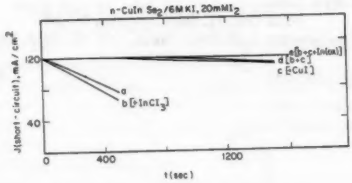
4,559,282
STABLE N-CUINSE$_2$/IODIDE-IODINE PHOTOELECTROCHEMICAL CELL

David Cahen, Rehovot, Israel, and Yih W. Chen, Lakewood, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1984, Ser. No. 652,396

Int. Cl.⁴ H01M *6/36*

U.S. Cl. 429—111 **24 Claims**



1. A photoelectrochemical solar cell, comprising:

a photoanode of n-CuInSe$_2$ with a surface layer of oxidized indium thereon;

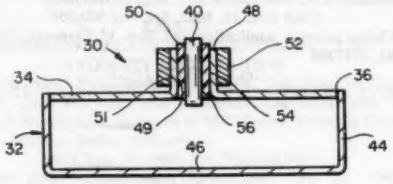
a cathode; and

an electrolyte providing a liquid junction between said photoanode and cathode comprising an iodine/iodide redox couple, and predetermined amounts of Cu and In ions sufficient to provide enhanced long term stability.

4,559,283
BATTERY CASING

Franz J. Kruger, Half Moon Bay, and Laszlo Szalvay, San Carlos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 21, 1984, Ser. No. 642,865
Int. Cl.⁴ H01M *2/08*
U.S. Cl. 429—174 **7 Claims**



1. A battery casing comprising:

a diametrical can having a side, a bottom transverse to the side and a flange portion transverse to the bottom, the flange portion having an outer periphery and an inner periphery, the inner periphery defining a can opening to be sealed;

a recoverable sealing ring;

sealing material; and

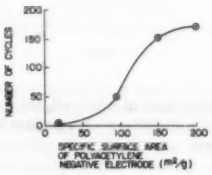
a central member;

the central member being inserted into and substantially filling the can opening, the sealing material positioned between the central member and the inner periphery of the flange portion, and the recoverable sealing ring surrounding the outer periphery of the flange portion so that upon recovery of the sealing ring, a compressive force is applied by the sealing ring so as to decrease the space between the flange portion, sealing material and central member and seal the casing, wherein a first contact surface is formed between the inner periphery of the flange portion and the sealing material and a second contact surface is formed between the sealing material and the central member, the pressure gradient across the sealing material between the first contact surface and the second contact surface being the same at any two adjacent locations on the sealing material.

4,559,284
SECONDARY BATTERY

Shigeoki Nishimura, Katsuta; Kazunori Fujita, Ibaraki; Hiroyuki Sugimoto; Atsuko Tohyama, both of Hitachi; Noboru Ebato, Hitachi, and Shinpei Matsuda, Ibaraki, all of Japan, assignors to Showa Denko K.K. and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,682
Claims priority, application Japan, Oct. 14, 1983, 58-190980
Int. Cl.⁴ H01M *10/36*
U.S. Cl. 429—213 **9 Claims**



1. In a secondary battery comprising a positive electrode, a negative electrode, and an electrolyte maintained between the electrodes, the electrodes each being made from a polymer having conjugated double bonds in a main chain, the negative electrode being doped with a cation from the electrolyte and the positive electrode being doped with an anion from the electrolyte, the improvement wherein the negative electrode has a larger electrode surface area than the positive electrode.

4,559,285
ELECTROPHOTOGRAPHIC RECORDING MATERIALS CONTAINING A METAL ACETYLACETONATE

Gerhard Hoffmann, Otterstadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 625,971
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324090
Int. Cl.⁴ G03G *5/10*
U.S. Cl. 430—49 **10 Claims**

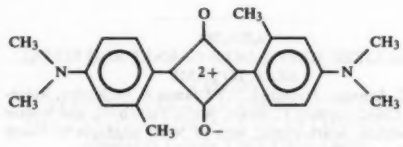
1. An electrophotographic recording material which comprises an electrically conductive base and, applied on this, an organic photoconductor layer containing one or more binders, one or more charge carrier-producing compounds or sensitizers, one or more charge carrier-transporting compounds and, in addition, from 0.5 to 30% by weight, based on the amount of binder, of a metal acetylacetonate.

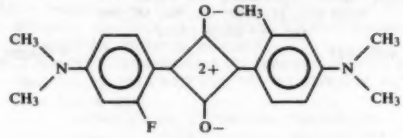
4,559,286
MIXED SQUARAINE PHOTOCONDUCTIVE COMPOSITIONS

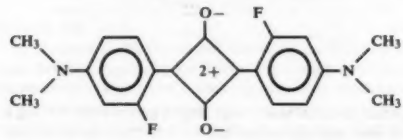
Peter M. Kazmaier; Giuseppa Baranyi; Cheng-Kuo Hsiao, and Richard A. Burt, all of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1984, Ser. No. 650,380
Int. Cl.⁴ G03G *15/02*
U.S. Cl. 430—59 **11 Claims**

1. An imaging member comprised of a supporting substrate; the mixed squaraine composition comprised of components I, II, and III







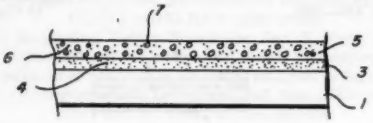
as a photogenerating pigment wherein fluorine is present in an amount of from about 0.050 to about 5 percent by weight; and in contact therewith an arylamine hole transport layer.

4,559,287

STABILIZED PHOTORESPONSIVE DEVICES CONTAINING ELECTRON TRANSPORTING LAYERS

T. Brian McAneney, Burlington; Rafik O. Loutfy, Willowdale; Beng S. Ong, and Zoran D. Popovic, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 13, 1984, Ser. No. 670,837
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—59 17 Claims



1. An improved photoresponsive imaging member consisting essentially of a supporting substrate, a photogenerating layer, comprised of a photogenerating pigment, an electron transporting layer comprised of derivatives of fluorenylidene methane dispersed in a resinous binder, and having incorporated therein a stabilizing amount of an aryl amine electron donating compound.

4,559,288

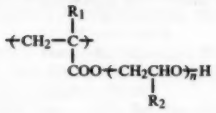
ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Sho Nakao; Kenji Kunichika; Chikashi Ohishi; Masato Iwai, and Kiyoshi Iwamoto, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,738
Claims priority, application Japan, Sep. 19, 1983, 58-172832
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—60 9 Claims

1. An electrophotographic photoreceptor in which an interlayer and a photoconductive photoreceptive layer are provided on a conductive support in that order, said interlayer comprising at least one colloidal substance selected from the group consisting of colloidal silica and colloidal alumina, and an organic solvent soluble resin which is composed of:

(A) a polymer having an acid value of from 10 to 100 and containing repeating units represented by formula (I) in the range of 30 to 80 wt.% and formula (II) in the range of 5 to 60 wt.%, based on the total weight of the polymer A:


(I)

wherein R_1 is H or CH_3; R_2 is H, $-CH_3$, $-C_2H_5$, or a chloromethyl group; and n is an integer of 1 to 10; and

(II)

wherein R_3 is H or $-CH_3$; and

(B) 5 to 30 parts by weight per 100 parts by weight of polymer (A) of at least one polymer selected from the group consisting of a homopolymer and plural copolymer having a glass transition point (Tg) of from −70 ° to 20° C.;

said colloidal substance being used in an amount of 30 to 300 parts by weight based on solid component per 100 parts by weight on the basis of solid component of said organic solvent-soluble resin; and said interlayer being provided in a coverage of 1.5 to 10.0 g/m^2.

4,559,289

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hiroshi Sunagawa; Kazuhiro Kawajiri; Keishiro Kido; Toshio Iijima, and Nobuharu Nozaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1984, Ser. No. 627,693
Claims priority, application Japan, Jul. 4, 1983, 58-121387
Int. Cl.[4] G03G 15/04
U.S. Cl. 430—66 16 Claims

1. An electrophotographic light-sensitive material comprising an electrically conductive support, an amorphous silicon photoconductive layer further comprising hydrogen and/or halogen on the support, and a layer of amorphous material consisting essentially of carbon and halogen atoms provided on the photoconductive layer,

wherein a low-photoconductivity amorphous silicon overcoat layer containing carbon atoms is provided between the amorphous silicon photoconductive layer and the layer of amorphous material comprising substantially carbon and halogen atoms.

4,559,290

HEAT DEVELOPMENT WITH REDUCIBLE DYE RELEASER

Satoru Sawada; Shinsaku Fujita, and Koichi Koyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 23, 1984, Ser. No. 582,655
Claims priority, application Japan, Feb. 23, 1983, 58-28928
Int. Cl.[4] G03C 1/40, 5/54
U.S. Cl. 430—203 21 Claims

1. A method of forming an image comprising imagewise exposing and heating a light-sensitive material in a substantially water-free condition, the material comprising a support having provided thereon a light-sensitive silver halide, a binder, a reducing agent capable of reducing the light-sensitive silver halide, an immobile dye-providing substance releasing a mobile dye by intramolecular nucleophilic displacement upon reduction with the reducing agent and an organosilver salt oxidizing agent.

4,559,291

LIGANDS FOR METALLIZABLE DYES

Stephen M. Neumann, Rochester; Glenn T. Pearce, Fairport, and Theophilus Sorrell, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,311
Int. Cl.[4] G03C 5/54, 1/40
U.S. Cl. 430—214 28 Claims

1. In a photographic assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a metallizable redox dye-releaser;

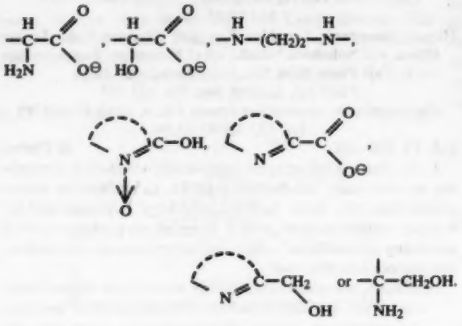
(b) a dye image-receiving layer;

(c) an alkaline processing composition and means containing same for discharge within said assemblage; and

(d) a transparent cover sheet located over the layer outermost from said support;

said assemblage containing an electron transfer agent;

the improvement wherein said assemblage also contains a ligand for preventing metal hydroxide formation and providing effective metallization of the dye released from said metallizable redox dye-releaser, said ligand having a coordinating site which is:



4,559,292

PHOTOSENSITIVE TRANSFER MATERIAL HAVING A SUPPORT OF DEFINED ROUGHNESS

Ulrich Geissler, Frankfurt am Main; Walter Herwig, Bad Soden am Taunus, and Helga Sikora, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,000

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1983, 3236560

Int. Cl.[4] G03C *3/00*

U.S. Cl. 430—256 9 Claims

1. A photosensitive transfer material comprising

(a) a thermoplastic photosensitive layer having a first surface and a second surface;

(b) a temporary flexible support film facing said first surface; and

(c) a removable cover film applied to said second surface, said cover film adhering to said photosensitive layer less strongly than said support film adheres to said photosensitive layer, the surface of said support film which faces said first surface of said photosensitive layer having an average surface roughness in the range of from 0.5 to 5 μm.

4,559,293

PHOTOSENSITIVE RECORDING MATERIAL DEVELOPABLE WITH AQUEOUS NEUTRAL SALT SOLUTION

Takeo Moriya; Toshio Yamagata, and Yasunori Sugiyama, all of Urawa, Japan, assignors to Kimoto & Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,377

Claims priority, application Japan, Apr. 8, 1983, 58-62858; Mar. 2, 1984, 59-41178

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—271 14 Claims

1. A photosensitive recording material developable with an aqueous neutral salt solution comprising:

a substrate in the form of a transparent film-forming thermoplastic polymer;

an actinic ray-shielding layer formed on the substrate, which comprises a binder which, at room temperature, is insoluble in pure water but swellable or soluble in aqueous neutral salt solution and at least one coloring component selected from the group consisting of dyes, pigments and actinic ray-absorbing agents said coloring component being 30–200% by weight of said binder; and

a photosensitive composition layer formed on the actinic ray-shielding layer, which comprises a binder which, at room temperature, is insoluble in pure water but soluble in aqueous neutral salt solution, a photopolymerizable unsaturated monomer, a photopolymerization initiator and a thermal polymerization inhibitor.

4,559,294

MANUFACTURING OF RELIEF PRINTING PLATES MADE OF PHOTO-SENSITIVE POLYMERIC MATERIAL

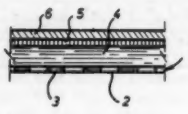
Juan A. Navarrete, Alcoy, Spain, assignor to Indagraf S/A, Barcelona, Spain

Filed Aug. 10, 1984, Ser. No. 640,157

Claims priority, application Spain, Aug. 31, 1983, 525778; Jun. 26, 1984, 533703

Int. Cl.[4] G03F *7/02*

U.S. Cl. 430—306 11 Claims



1. A method for manufacturing relief printing plates made of a photo-sensitive polymeric material, comprising the steps of: providing a photographic negative having opaque areas and transparent areas defining a desired printing relief pattern; applying a layer of viscous photo-sensitive resin on said photographic negative; providing a flexible support base having a roughened surface and applying it on said layer of viscous resin with said roughened surface contacting said layer of resin; projecting ultraviolet radiation on only said negative for hardening any of said resin which is exposed to said ultraviolet radiation through said transparent areas of said negative, thereby forming the printing relief and causing said resin to adhere to said roughened surface during hardening; and removing said negative and recovering any of said resin from behind said opaque areas which was not hardened during said radiation projecting step.

4,559,295

PROCESS FOR REGENERATING SOLUTION FOR DEVELOPING OR PEELING ALKALI-TYPE PHOTOSENSITIVE FILM

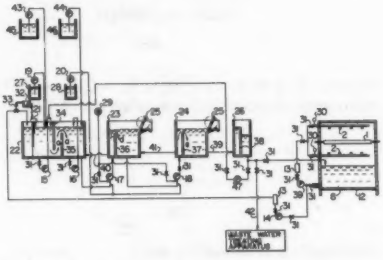
Yoshiaki Tomisawa; Toshio Takeuchi; Keijiro Honda, all of Hitachi; Susumu Takahashi, Ibaraki, and Seiji Kinoda, Fujisawa, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Division of Ser. No. 510,911, Jul. 5, 1983, Pat. No. 4,519,690. This application Feb. 4, 1985, Ser. No. 697,769

Claims priority, application Japan, Aug. 6, 1982, 57-137822

Int. Cl.[4] G03C *5/24, 11/24;* G03F *7/26*

U.S. Cl. 430—325 4 Claims



1. A process for developing or imagewisely peeling an alkali-type photosensitive film which comprises

developing or imagewisely peeling an alkali-type photosensitive film with a developing or peeling solution,

taking off the developing or peeling solution containing a released photosensitive film suspension from a developing or peeling device,

introducing one or more reagents and a gas into the develop-

ing or peeling solution to deposit the suspension in floc state,

removing the flocculated deposit in floating state out of the developing or peeling solution, and

taking a part or whole of the resulting treated developing or peeling solution out of the system.

4,559,296
PHOTOGRAPHIC RECORDING MATERIAL CONTAINING NEW AZO DYES

Peter Bergthaller; Lothar Rosenhahn; Karl J. Herd; Hauke Fuerstenwerth, all of Cologne, and Rudolf Stolzenburg, Langenfeld, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

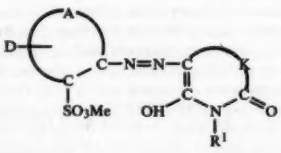
Filed Apr. 25, 1984, Ser. No. 603,694

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316887

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—519 **11 Claims**

1. A photographic material having one or more layers comprising at least one photosensitive silver halide emulsion layer wherein at least one layer contains in an effective amount a dye corresponding to the following general formula:



(I)

wherein

A represents the radical required to complete a diazo component of the benzene series,

K represents the radical required to complete a coupling cmponent of the class of hydroxy pyridones;

D represents a group having electron donor properties in the p-position to the azo group;

R^1 represents H or alkyl, cycloalkyl, aryl or aralkyl;

Me represents hydrogen or a cation;

with the proviso that at least one other solubilising group is present.

4,559,297
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING STABILIZER

Nobuo Seto; Nobuo Furutachi; Masakazu Morigaki, and Kiyoshi Nakazyo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

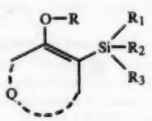
Filed Feb. 7, 1985, Ser. No. 699,091

Claims priority, application Japan, Feb. 7, 1984, 59-20538; Sep. 6, 1984, 59-186857

Int. Cl.[4] G03C *7/26*

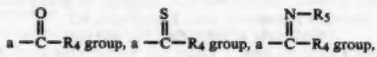
U.S. Cl. 430—551 **19 Claims**

1. A silver halide photogrpahic light-sensitive material comprising a support having thereon at least one photographic layer containing at least one compound represented by formula (I):



(I)

wherein R represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group,



a substituted or unsubstituted silyl group, a substituted or unsubstituted phosphoric acid group, or a divalent group derived from the above-described groups which forms a ring together with the oxygen atom linking to —R and the carbon atom which is in the ortho-position to —O—R and to which

is not bonded; R_1, R_2 and R_3 which may be the same or different each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; Q represents an atomic group necessary to form a substituted or unsubstituted aromatic ring; R_4 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted amino group, a substituted or unsubstituted cycloamino group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted acyl group, or a substituted or unsubstituted alkoxycarbonyl group; and R_5 represents a H atom, substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted aryl group.

4,559,298
CRYOPRESERVATION OF BIOLOGICAL MATERIALS IN A NON-FROZEN OR VITREOUS STATE

Gregory M. Fahy, Rockville, Md., assignor to American National Red Cross, Washington, D.C.

Filed Nov. 23, 1982, Ser. No. 444,057

Int. Cl.[4] A01N *1/02*; F25C *1/00*

U.S. Cl. 435—1 **18 Claims**

1. An improved method for the cryopreservation of biological materials wherein the biological material is cooled to a vitreous state under pressure in the presence of an aqueous vitrification solution containing penetrating glass-forming solutes, the improvement comprising (a) replacing a sufficient amount of said penetrating solute in said solution with an equivalent amount of non-penetrating glass-forming solute to reduce damage to the biological material when exposed thereto; (b) treating the biological material with the solution obtained from step (a) at a rate and duration sufficient to prevent cells in said biological material from returning to isotonic volume prior to vitrification; and (c) then subjecting the biological material to a pressure sufficient for vitrification upon cooling without substantial nucleation or ice crystal growth and without significant injury to the biological material.

4,559,299

CYTOTOXICITY ASSAYS IN CELL CULTURING DEVICES

M. Boris Rotman, Jamestown, R.I., assignor to Brown University Research Foundation Inc., Providence, R.I.

Filed Feb. 4, 1983, Ser. No. 463,669

Int. Cl.[4] C12Q *1/29, 3/00;* **C12N** *5/00, 5/02;* **C12M** *3/00, 1/00, 1/34;* **G01N** *33/54*

U.S. Cl. 435—29 **10 Claims**

1. A method of assaying the sensitivity of biopsied cells to therapeutic agents, the method comprising:

(a) culturing the cells in a cell culturing apparatus which comprises either at least one semi-permeable membrane surface or at least one semi-permeable capillary vessel which enables the perfusion of nutrients to the biopsied cells;

(b) contacting the cells with a fluorogenic substrate, whereby living cells release an initial characteristic amount of fluorescence;

(c) measuring said initial fluorescence to establish a baseline;

(d) introducing the agent into the culturing apparatus; and

(e) measuring changes in the fluorescence released by the cells as an indicator of the sensitivity of the cells to the agent.

4,559,300

METHOD FOR USING AN HOMOLOGOUS BACILLUS PROMOTER AND ASSOCIATED NATURAL OR MODIFIED RIBOSOME BINDING SITE-CONTAINING DNA SEQUENCE IN STREPTOMYCES

Steven Kovacevic; Jeffrey T. Fayerman; James R. Miller, and Mark A. Richardson, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 18, 1983, Ser. No. 458,803

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 1/20, 1/00*

U.S. Cl. 435—68 **58 Claims**

1. A method for expressing a functional polypeptide in Streptomyces comprising transforming a Streptomyces host cell with a recombinant DNA expression vector, said vector comprising

(1) a homologous Bacillus promoter,

(2) Bacillus ribosome binding site-containing DNA sequence, and

(3) a gene encoding a functional polypeptide and culturing said transformed Streptomyces cell under growing conditions, subject to the limitations that said vector replicates and is selectable in said transformed Streptomyces cell and that said promoter and said DNA sequence direct transcription and expression of said gene in said transformed Streptomyces host cell.

4,559,301

PROCESS FOR PREPARING MACROCIN DERIVATIVES

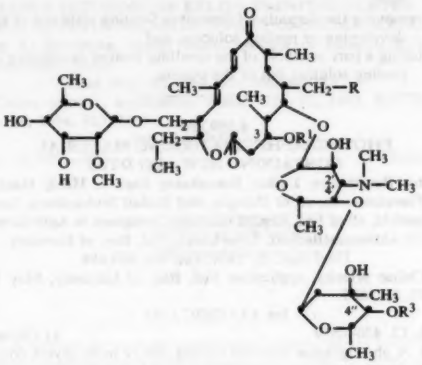
Jan R. Turner, Carmel; Veronica M. Krupinski, Greenwood; David S. Fukuda, Brownsburg, and Richard H. Baltz, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 3, 1983, Ser. No. 471,628

Int. Cl.[4] C12P *19/62;* **C12N** *9/10;* **C12R** *1/465;* **C07J** *0/00*

U.S. Cl. 435—76 **8 Claims**

1. The method of producing a compound of the formula:



wherein

R is formyl or hydroxymethyl;

R^1 is hydrogen, acetyl or propionyl; and

R^3 is hydrogen, acetyl, propionyl, n-butyryl or isovaleryl;

provided that one of R^1 or R^3 must be other than hydrogen; which comprises contacting macrocin with an acyl donor in the presence of an acylating enzyme system selected from that produced by *Streptomyces thermotolerans* ATCC 11416, *Streptomyces thermotolerans* NRRL 15270 or *Streptomyces fungicidicus subsp. espinomyceticus* ATCC 21574 in an aqueous medium until a substantial amount of the compound is produced.

4,559,302

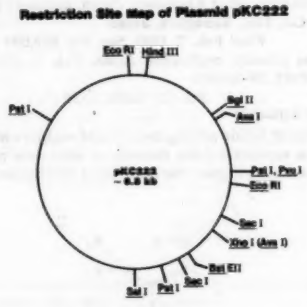
DNA FOR DIRECTING TRANSCRIPTION AND EXPRESSION OF STRUCTURAL GENES

Thomas D. Ingolia, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 1, 1982, Ser. No. 438,070

Int. Cl.[4] C12N *15/00, 1/20, 1/00;* **C12P** *21/00, 21/02;* **C07H** *15/12*

U.S. Cl. 435—172.3 **18 Claims**



1. A constructed DNA consisting essentially of the promoter, Shine-Dalgarno sequence, and translational start triplet of the polycistronic apramycin (aac(3)IV) and hygromycin (aph(4)) resistance genes.

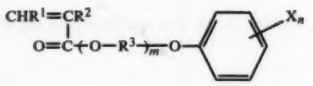
4,559,303

CARRIER COMPOSED OF PARTICULATE POLYMER

Seiji Aotani, Yokohama, and Hisanori Kanayama, Machida, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,502
Claims priority, application Japan, May 28, 1982, 57-89707
Int. Cl.[4] C12N *11/08*; G01N *33/54*; A61K *31/78*
U.S. Cl. 435—180 11 Claims

11. A reagent for detecting an antigen or antibody consisting of a carrier consisting essentially of polymer particles obtained by polymerizing a monomer having by the formula:



wherein R^1 and R^2, which are the same or different, are hydrogen atoms or alkyl groups having 1 to 4 carbon atoms; R^3 is a straight-chain or branched alkylene group having 2 or 3 carbon atoms, which is unsubstituted or substituted by a hydroxyl group; X is one or more of the same or different halogen atoms; m is zero or an integer of 1 to 10; and n is an integer of 1 to 5; or by polymerizing said monomer with at least one other vinyl monomer copolymerizable therewith; and wherein said biological substance is an immunoreactive substance.

4,559,304

SUBSTRATUM FOR CELL CULTURE AND A METHOD FOR CULTURING AND ISOLATING CELLS USING SAME

Shunji Kasai, Hirakata; Toshihiro Akaike, Houya, and Teruo Miyata, Tokyo, all of Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,083
Claims priority, application Japan, Aug. 9, 1982, 57-138153
Int. Cl.[4] C12N *5/00*; C12R *1/91*
U.S. Cl. 435—240 11 Claims

1. In a mammalian cell culture containing a substratum and nutrient medium, the improvement comprising a substratum composed of collagen which has been modified by chemical means to increase the charge of the collagen to a degree sufficient to enhance mammalian cell attachment.

8. An improved method for culturing and isolating mammalian cells wherein the cells are cultured under conventional culture conditions, according to the type of cell being cultured, and collagen is used as a substratum for attaching the cells during culturing, the improvement comprising:

adhering the mammalian cells to collagen which has been modified by chemical means to increase the charge of the collagen, and

incubating the mammalian cells and treating the animal cells with bivalent cation chelating agent to isolate and recover the cells.

4,559,305

MICROBIAL CULTURE SYSTEM

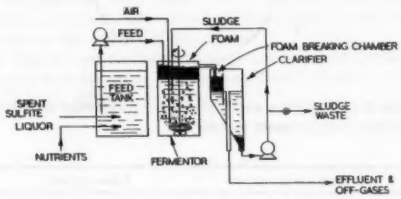
James E. Zajic; Martha A. Hill, both of London; Donald F. Manchester, Oakville, and Karel Muzika, Ottawa, all of Canada, assignors to Abitibi Paper Company Ltd., Toronto, Canada

Continuation of Ser. No. 36,646, May 7, 1979, abandoned, which is a division of Ser. No. 790,852, Apr. 25, 1977, Pat. No. 4,211,645. This application Jun. 3, 1981, Ser. No. 270,013
Claims priority, application Canada, Jul. 16, 1976, 257177
Int. Cl.[4] C12N *1/00*
U.S. Cl. 435—243 2 Claims

1. A biologically pure microbial culture system acclimatized to SSL and having at least one of the following fungal components, which have been identified through isolation and accepted taxonomical procedures:

1. *Phialophora jeanselmei* (Langeron) Emmons (ATCC 20,482),
2. *Phialophora richardsiae* (Nangeldt apud Melin & Nannf.) Conant (ATCC 20,483),
3. *Hyalodendron lignicola* Diddens (ATCC 20,484),
4. *Trichosporon infestans* (Moses & Vianna) Ciferri & Redaelli (ATCC 20,485),
5. *Candida tropicalis* (Castellani) Berkout (ATCC 20,486),

said fungal compounds acclimatized to SSL.



2. A microbial culture system acclimatized to SSL and consisting essentially of five principal components, all fungi, which have been identified through isolation and accepted taxonomical procedures as the following:

1. *Phialophora jeanselmei* (Langeron) Emmons (ATCC 20,482),
2. *Phialophora richardsiae* (Nannfeldt apud Melin & Nannf.) Conant (ATCC 20,483),
3. *Hyalodendron lignicola* Diddens (ATCC 20,484),
4. *Trichosporon infestans* (Moses & Vianna) Ciferri & Redaelli (ATCC 20,485),
5. *Candida tropicalis* (Castellani) Berkout (ATCC 20,486),

said components acclimatized to SSL.

4,559,306

MODIFIED *PASTEURELLA MULTOCIDA* BACTERIA

Carrell J. Kucera, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 255,144, Apr. 17, 1981, Pat. No. 4,335,106. This application Feb. 5, 1982, Ser. No. 346,343
Int. Cl.[4] C12N *1/20, 15/00*; C12R *1/18*
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of *Pasteurella multocida* bacterial having all of the identifying characteristics of ATCC No. 31610.

4,559,307

TREATMENT OF YEAST CELLS WITH PROTEOLYTIC ENZYMES

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 17, 1983, Ser. No. 542,846
Int. Cl.[4] C07K *3/12*; A23L *1/28*; C12N *1/16*
U.S. Cl. 435—272 7 Claims

1. A process for the recovery of functional protein from undenatured yeast cells which comprises contacting said undenatured yeast cells with an alkaline protease at a temperature of from about 20° C. to about 40° C. for about 2 minutes to 2 hours and at a pH of from about 8 to about 11.

4,559,308

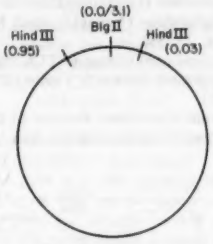
CORYNEBACTERIUM PLASMID AND VECTOR

Robert C. Nutter, El Cerrito, and Lucy C. Panganiban, San Francisco, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Filed Jan. 27, 1983, Ser. No. 461,364
Int. Cl.[4] C12N *1/00, 15/00*
U.S. Cl. 435—317 1 Claim

1. An essentially pure plasmid pRN3.1 isolated from *Coryne-*

bacterium glutamicum, characterized by a molecular weight of



about 2×10^6 daltons and a plurality of cleavage sites for restriction endonucleases as follows:

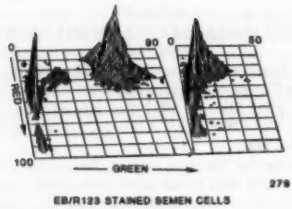
Restriction enzyme	Cleavage site
Hind III	2
Bgl II	1
Kpn I	0
Sal I	0
Hinf I	>7
Hae III	>10.

4,559,309

FLOW CYTOMETRY-FLUORESCENCE MEASUREMENTS FOR CHARACTERIZING SPERM

Donald P. Evenson, Brookings, S. Dak., and Zbigniew Darzynkiewicz, Cheppaque, N.Y., assignors to Memorial Sloan Kettering Cancer Center, New York, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,862
Int. Cl.[4] G01N *21/64, 33/52*
U.S. Cl. 436—63 **2 Claims**



1. Process for characterizing sperm motility and viability comprising the steps of

staining a sample of the sperm with Rhodamine 123 and ethidium bromide,

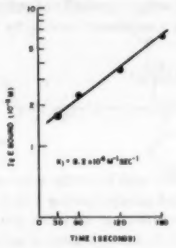
applying flow cytographic measuring techniques to count, simultaneously, the sperm fluorescence emissions at green frequencies 515–575 nm and at red frequencies 600–650 nm, the green counts being correlated with sperm motility and the red counts being correlated with putative dying or dead cells.

4,559,310

ASSAY METHODS AND SYSTEMS UTILIZING MAST CELL CLONES

Harvey I. Cantor, Boston, and Gary Nabel, Cambridge, both of Mass., assignors to Dana Farber Cancer Institute, Boston, Mass.

Filed May 20, 1983, Ser. No. 496,543
Int. Cl.[4] G01N *33/54*; C12Q *1/29*
U.S. Cl. 436—519 **19 Claims**



1. A method of testing a material for its use in preventing allergic reactions in mammalian tissue, comprising: (a) sensitizing cloned mast cells in vitro with an immunoglobulin directed to a selected allergen; (b) admixing the resulting sensitized mast cells with the material to be tested; (c) contacting the sensitized mast cells with the allergen; and (d) determining, from the products of admixture, whether an immunoglobulin/allergen/-mast cell reaction has occurred.

4,559,311

DIAGNOSTIC METHOD USING ONCOFETAL PEPTIDE AS A TUMOR MARKER

Ulf-Hakan Stenman, Heikelsvägen 10, SF-02700 Grankulla, and Marja-Liisa Huhtala, Mörtniisvägen 15 E, SF-00210 Helsingfors 21, both of Finland

Filed Jul. 21, 1982, Ser. No. 400,384
Claims priority, application Sweden, Aug. 27, 1981, 8105071
Int. Cl.[4] G01N *33/54, 33/58*; A61K *39/00*; C07C *103/52*
U.S. Cl. 436—542 **2 Claims**

2. Method for the diagnosis of cancer tumors which comprises determining the concentration of oncofetal urine peptide in the blood serum or the urine of the patient, the oncofetal urine peptide having a molecular weight of about 6,500 as determined by gel chromatography and having a N-terminal amino acid sequence wherein the first ten amino acids are:

1	2	3	4	5	6	7	8	9	10	
ASP—	SER—	LEU—	GLY—	X—	GLU—	ALA—	LYS—	X—	TYR—	μm

wherein X is an unidentified amino acid moiety.

4,559,312

SINTERING OR REACTION SINTERING PROCESS FOR CERAMIC OR REFRACTORY MATERIALS USING PLASMA ARC GASES

Jonathan J. Kim, Williamsville, and Viswanathan Venkateswaran, Grand Island, both of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Sep. 19, 1983, Ser. No. 533,596
Int. Cl.[4] F27B *9/10*
U.S. Cl. 501—1 **8 Claims**

1. A process for sintering ceramic or refractory materials wherein the improvement comprises injection of a combined primary plasma arc gas with a secondary colder gas from at least one plasma arc torch, directly into at least one gas port of

a furnace, said secondary gas being injected into said plasma arc gas tangentially, thereby creating a swirl effect wherein the

secondary gas surrounds the core of the primary plasma arc gas.

4,559,313

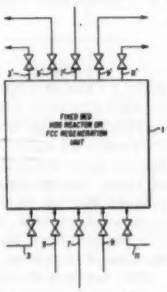
REMOVAL OF INORGANIC CONTAMINANTS FROM CATALYSTS

Allan S. Myerson, Marietta, and William R. Ernst, Roswell, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Continuation-in-part of Ser. No. 313,458, Oct. 21, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 517,027

Int. Cl.⁴ B01J *23/94, 21/20;* **C22B** *3/00;* **C12D** *13/00*

U.S. Cl. 502—25 **14 Claims**



1. A method for regenerating spent catalysts selected from the group consisting of porous cobalt-molybdenum catalysts which are used in the hydrotreating of petroleum residues and silica-alumina zeolite cracking catalysts which are used in the cracking of hydrocarbon feedstocks for the removal of nickel and vanadium impurities, comprising:

(a) treating said spent catalyst with a 1–10% mixture of hydrogen sulfide in an inert gas at elevated temperature for a time sufficient to sulfide the spent catalyst; and

(b) treating the sulfided catalyst with an aqueous ferric ion containing solution without added oxidizing bacteria, thereby leaching impurity metal ions from said catalyst.

2. The method of claim 1, wherein, prior to said processing, said spent catalyst is prepared for regeneration by draining residual oil from said spent catalyst, washing oil from the catalyst pores by circulation of solvent through the spent catalyst, and removing carbon deposits from said washed catalyst.

9. The method of claim 1, wherein the sulfided catalyst is leached with from 0.1 to 2.0 molar ferric ion containing solution for 1–40 minutes at a temperature of 25° to 100° C.

4,559,314

ZEOLITE ACTIVATION

David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 360,749, Mar. 22, 1982, abandoned. This application Jan. 23, 1984, Ser. No. 573,776

Int. Cl.⁴ B01J *29/28*

U.S. Cl. 502—71 **21 Claims**

1. A method of producing an improved catalyst, which method comprises forming a composite of a crystalline aluminosilicate zeolite having a silica:alumina ratio of at least 100 and a Constraint Index from 1 to 12, a binder that contains alumina, and water, and contacting the composite with steam to enhance the activity of the catalyst.

4. The method described in claim 1 in which the zeolite is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35 and ZSM-38.

4,559,315

ZEOLITE MODIFICATION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 465,987, Feb. 14, 1983, Pat. No. 4,513,091. This application Jul. 16, 1984, Ser. No. 631,687

Int. Cl.⁴ B01J *29/28*

U.S. Cl. 502—71 **28 Claims**

1. A method for modifying a composition to increase its acid catalytic activity, said composition comprising a physical mixture of a ZSM-5 type zeolite and a solid source of aluminum, which method comprises:

contacting said mixture with liquid water in the presence of an activating amount of an alkali metal cation and under a combination of conditions including a temperature up to about 370° C. for less than about 1 hour to about 100 hours, said combination of conditions being effective to induce said increased activity.

4,559,316

COPPER-ZIRCONIUM-MANGANESE-CONTAINING CATALYSTS

Terry J. Mazanec, and John G. Frye, Jr., both of Solon, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 21, 1984, Ser. No. 653,946

Int. Cl.⁴ B01J *21/06, 23/02, 23/34, 23/72*

U.S. Cl. 502—73 **11 Claims**

1. A catalyst comprising a complex of the formula

$$Cu_aZrMn_bY_cA_dO_x$$

wherein

Y is selected from the group consisting of Al, Zn, Ce, Cr, Co, Pd, Pt, Rh, Ag, Ru, Re, Os, Ta, Nb or a mixture of two or more thereof,

A is an alkali or alkaline earth metal or a mixture of alkali and/or alkaline earth metals,

a is from about 0.1 to about 3,

b is from about 0.01 to about 3,

c is from 0.01 to about 3,

d is from about 0.02 to about 2.5, and

x is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,559,317

OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 654,923, Sep. 27, 1984. This application Mar. 12, 1985, Ser. No. 710,810
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—104 19 Claims

13. A process for producing a catalyst for the polymerization of olefins comprising

combining partially fluorinated magnesium alkoxide and halogenated tetravalent titanium compound under conditions to form a suspension containing the product of said alkoxide and said titanium compound, and

reacting the product thus produced with an organoaluminum compound to form a polymerization catalyst system.

4,559,318

SUPPORTED VANADIUM DIHALIDE-ETHER COMPLEX CATALYST

Paul D. Smith, and Joel L. Martin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 488,887, Apr. 26, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,726
Int. Cl.[4] C08F *4/68*
U.S. Cl. 502—110 38 Claims

20. A method comprising:

contacting a cyclic ether with a vanadium compound selected from VX_4 and VX_3 wherein X is a halogen to form a complex;

contacting said complex with a reducing agent at least a part of which is selected from zinc metal and organozinc compounds to reduce the valence of said vanadium to +2; and

combining the thus produced VX_2-ether-zinc complex with a porous support.

22. A method according to claim 20 wherein said vanadium compound is VCl_4 and said VCl_4 is reacted in a chlorinated hydrocarbon solvent with said ether, said ether being THF, to give a VCl_4—THF complex;

thereafter said VCl_4—THF complex is contacted with a reducing agent selected from at least one of zinc metal and organozinc compounds to give a product comprising $VCl_2.ZnCl_2.4THF$.

23. A method according to claim 22 wherein prior to contacting said VCl_4-ether complex with said zinc metal or an organozinc compound, the VCl_4 is reduced to VCl_3 with a separate reducing agent.

24. A method according to claim 23 wherein said separate reducing agent is selected from organoboron compounds and organoaluminum compounds.

4,559,319

CURING AGENT COMPOSITION FOR SILICONE ELASTOMERS

Akitsugu Kurita, and Tetsuo Fujimoto, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,863
Claims priority, application Japan, Mar. 26, 1984, 59-57765
Int. Cl.[4] B01J *31/12*
U.S. Cl. 502—156 3 Claims

1. A curing agent composition for silicone elastomers, comprising an organic tin compound which is solubilized in water with the use of a nonionic surfactant selected from the group consisting of polyoxyethylene sorbitol fatty acid esters and polyoxyethylene sorbitan fatty acid esters and a polyvalent alcohol.

4,559,320

CATALYSTS FOR OLEFIN CONVERSIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 607,051, May 4, 1984. This application Apr. 9, 1985, Ser. No. 721,351
Int. Cl.[4] B01J *23/02, 23/28, 23/30, 23/36*
U.S. Cl. 502—251 9 Claims

1. A catalyst composition comprising a Group IIA metal component deposited onto the surface of a support containing at least one of a Group VIB metal component and rhenium component.

4,559,321

PROCESS FOR PRODUCING WIDE PORE CATALYST SUPPORTS

Lynn H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1985, Ser. No. 695,340
Int. Cl.[4] B01J *21/04, 21/08, 21/12*
U.S. Cl. 502—263 7 Claims

1. A process for the preparation of porous inorganic oxides having at least 10% of their pore volume in pores of greater than 350 Å which process comprises:

(a) forming a mixture of a hydrous gel of aluminum oxide, silicon oxide or aluminum-silicon oxide with from about 1 to about 10 percent by weight basis anhydrous oxide of humic acid or an alkali metal salt of humic acid,

(b) drying the mixture of step (a),

(c) calcining the product of step (b) at a temperature sufficient to convert the gel to an oxide,

(d) heating the product of step (c) in an oxygen-containing atmosphere at a temperature sufficient to burn-out the humic acid.

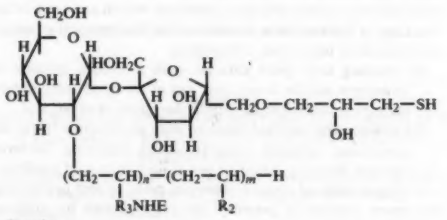
4,559,322

NON-ABSORBABLE COMPOUNDS OF MUCOLYTIC ACTIVITY, THE PROCESS FOR THEIR PREPARATION, AND THERAPEUTIC COMPOSITIONS WHICH CONTAIN THEM AS ACTIVE PRINCIPLE

Javier E. Maltz, Buenos Aires, Argentina, assignor to Etablissement Texcontor, Vaduz, Liechtenstein

Division of Ser. No. 184,249, Sep. 5, 1980, Pat. No. 4,409,138. This application Jul. 11, 1983, Ser. No. 512,679
Claims priority, application Italy, Jul. 1, 1980, 23161 A/80
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.[4] A61K *37/00;* C07G *7/00*
U.S. Cl. 514—8 2 Claims

1. A compound of mucolytic activity, not adsorbable by tissues, with a molecular weight between 10,000 and 300,000 of the formula:



wherein:

R_2 is —COOH or —$CONH_2$

n is 1 to 2000

m is 0 to 1000

R_3 is —CO—, —$COO(CH_2)_3$—O— —NHE represents the radical of an enzyme chosen from deoxyribonuclease and trypsin,

each carbohydrate unit carrying at least one enzyme residue and at least one free sulphydryl group.

2. A therapeutic composition having mucolytic activity for topical or aerosol application, comprising a mucolytically effective amount of a compound according to claim 1 and a therapeutically acceptable diluent or carrier.

4,559,323

A41030 ANTIBIOTICS

Karl H. Michel, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

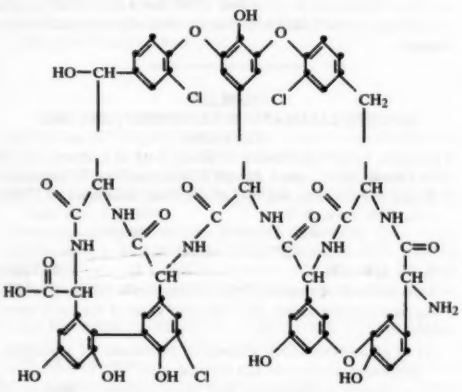
Division of Ser. No. 443,496, Nov. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 361,301, Mar. 24, 1982, abandoned. This application Aug. 2, 1984, Ser. No. 637,096

Int. Cl.[4] A61K *37/00*

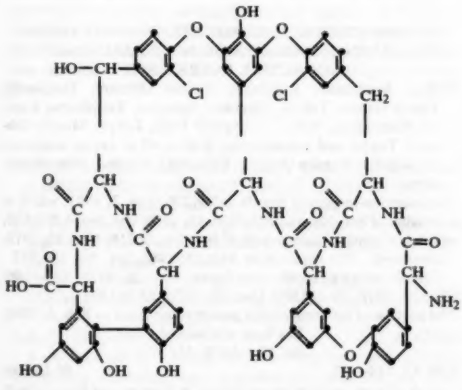
U.S. Cl. 514—9 **20 Claims**

1. A feed composition useful for increasing feed efficiency in ruminants which comprises a propionate-increasing amount of antibiotic A41030 complex comprising:

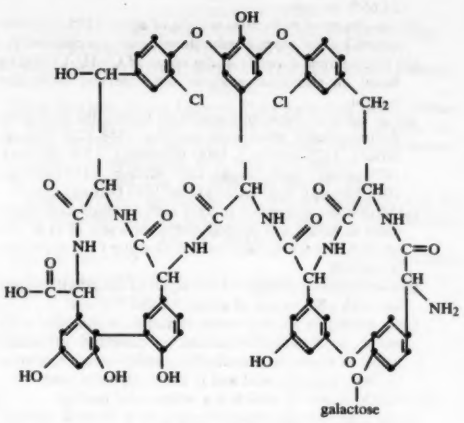
(1) A41030 factor A, which has the structure



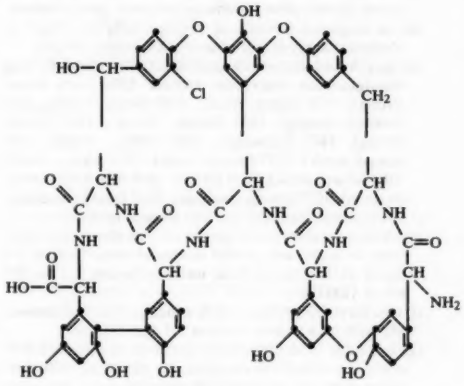
(2) A41030 factor B, which has the structure



(3) A41030 factor C, which has the structure



(4) A41030 factor E, which has the structure



(5) A41030 factor D, which is a white, amorphous solid, having:

(a) an approximate elemental analysis of 54.46% carbon, 4.35% hydrogen, 7.58% nitrogen, 4.27% chlorine, and by difference, 29.34% oxygen;

(b) an observed molecular weight of about 1326, as determined by fast atom bombardment mass spectrometry;

(c) an infrared absorption spectrum having the following distinguishable maxima: 3448-3226 (strong, broad), 2959 (weak), 1661 (strong), 1592 (strong), 1511 (strong), 1429 (weak), 1290 (weak), 1227 (weak), 1212 (medium), 1163 (weak), 1143 (weak), 1053 (medium) and 1010 (strong) cm^{-1};

(d) ultraviolet absorption spectra with an absorption maximum in acidic and neutral methanol:water (1:1) at 278 nm (ϵ 10,600) and in basic methanol:water (1:1) at 298 nm (ϵ 19,900);

(e) two titratable groups in 66% aqueous dimethylformamide with pKa values of about 5.5 and 7.6; and

(f) is soluble in alcohol-water mixtures, in dimethyl sulfoxide, in dimethylformamide, in dimethyl sulfoxide-water mixtures, in dimethylformamide-water mixtures, in dilute aqueous acid and in dilute aqueous base;

(6) A41030 factor F, which is white solid having:

(a) an approximate elemental analysis of 51.39% carbon,

3.96% hydrogen, 6.45% nitrogen, 6.45% chlorine and 28.65% oxygen;

(b) an observed molecular weight of about 1555, as determined by fast atom bombardment mass spectrometry;

(c) an empirical formula in the range of $C_{70}H_{64}Cl_3N_7O_{28}$ based on elemental analysis and observed molecular weight;

(d) an infrared absorption spectrum having the following distinguishable absorption maxima: 3448-3226 (strong, broad), 1653 (strong), 1600 (medium), 1504 (strong), 1429 (weak), 1258 (weak), 1227 (strong), 1136 (strong), 1075 (strong), 1053 (strong) and 1010 (strong) cm^{-1};

(e) ultraviolet absorption spectra with an absorption maximum in acidic and neutral methanol:water (1:1) at 278 nm (ε 9,300) and in basic methanol:water (1:1) at 298 nm (ε 14,500);

(f) two titratable groups in 66% aqueous dimethylformamide with pKa values of about 5.4 and 7.1; and

(g) is soluble in alcohol-water mixtures, in dimethyl sulfoxide, in dimethylformamide, in dimethyl sulfoxide-water mixtures, in dimethylformamide-water mixtures, in dilute aqueous acid and in dilute aqueous base;

(7) A41030 factor G, which is a white solid having:

(a) an approximate elemental analysis of 50.02% carbon, 4.61% hydrogen, 4.74% chlorine, 6.11% nitrogen and 30.70% oxygen;

(b) an observed molecular weight of about 1684, as determined by fast atom bombardment mass spectrometry;

(c) an empirical formula of $C_{78}H_{83}Cl_3N_8O_{28}$, based on elemental analysis and observed molecular weight;

(d) an infrared absorption spectrum having the following distinguishable absorption maxima: 3320 (very broad, strong), 2975 (sharp, weak), 2920 (sharp, weak), 1659 (normal, strong), 1594 (broad, strong), 1512 (sharp, strong), 1492 (shoulder), 1430 (sharp, weak), 1386 (broad, weak), 1337 (broad, weak), 1308 (sharp, weak), 1264 (sharp, weak), 1230 (broad, medium), 1145 (broad, medium), 1077 (sharp, medium), 1062 (sharp, medium), 1014 (sharp, medium) and 846 (broad, medium) cm^{-1};

(e) ultraviolet absorption spectra with an absorption maximum in acidic and neutral methanol:water (1:1) at 278 nm (ε 15,000) and in basic methanol:water (1:1) at 298 nm (ε 18,000);

(f) two titratable groups in 66% aqueous dimethylformamide with pKa values of about 5.4 and 7.0; and

(g) is soluble in alcohol-water mixtures, in dimethyl sulfoxide, in dimethylformamide, in dimethyl sulfoxide-water mixtures, in dimethylformamide-water mixtures, in dilute aqueous acid and in dilute aqueous base;

individual A41030 factors A, B, C, D, E, F or G; or a pharmaceutically-acceptable salt thereof, and a feed ration.

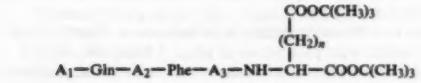
4,559,324

POLYPEPTIDE-DIESTERS, THEIR PRODUCTION AND USE

Masahiko Fujino, Hyogo, and Chieko Kitada, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1983, Ser. No. 513,340
Claims priority, application Japan, Jul. 28, 1982, 57-132657
Int. Cl.⁴ C07C *103/52*; A61K *37/02*
U.S. Cl. 514—14 **14 Claims**

1. A compound of the formula:



wherein

A_1 is arginine or lysine or a di- or tripeptide residue having arginine or lysine at its N-terminal and wherein the additional amino acid residue constituting the di- or tripeptide are Gly, Pro, (D)-Pro, Thr, (D)-Thr, Ser, (D)-Ser, Ala, (D)-Ala, Val, (D)-Val, Leu, (D)-Leu, Ile, (D)-Ile, Gln, (D)-Gln, Asn or (D)-Asn;

A_2 is an aromatic amino acid residue of the class consisting of Trp, (D)-Trp, Phe (D)-Phe, Tyr or (D)-Tyr;

A_3 is a neutral amino acid residue of the class consisting of Gly, Ala, (D)-Ala, Val, (D)-Val, Leu, (D)-Leu, Ile or (D)-Ile or aromatic amino acid residue of the class consisting of Trp, (D)-Trp, Tyr, (D)-Tyr, Phe or (D)-Phe; and,

n is 0, 1 or 2,

or a pharmaceutically acceptable salt thereof.

4,559,325

PURIFIED ANTINEOPLASTON FRACTIONS AND METHODS OF TREATING NEOPLASTIC DISEASE

Stanislaw R. Burzynski, #5 Concord Clr., Houston, Tex. 77024

Continuation of Ser. No. 330,383, Dec. 15, 1981, Pat. No. 4,470,970, which is a continuation of Ser. No. 279,728, Jul. 2, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,873
Int. Cl.⁴ A61K *37/00*; C07G *7/00*
U.S. Cl. 514—21 **53 Claims**

1. A method for inhibiting growth of neoplastic cells in a host, which method comprises administering pharmaceutically to neoplastic cells a growth-inhibiting substance having at least one chemical structure which occurs as an antineoplastic ingredient eliminated in urine and which has a molecular weight of less than about 5,000, and pharmaceutically acceptable salts thereof.

4,559,326

ANTIINFLAMMATORY COMPOSITIONS AND METHODS

Thomas C. Crawford; Stanley L. Keely, both of Ledyard; David L. Larson, East Lyme; Joseph G. Lombardino, Niantic, and James J. Maciejko, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,686
Int. Cl.⁴ A61K *31/70, 31/605*
U.S. Cl. 514—23 **4 Claims**

1. A method of treating inflammation in a mammal which comprises administration of a mammal in need for such treatment:

(a) an antiinflammatory amount of piroxicam, or a pharmaceutically acceptable salt thereof; and

(b) a gastric antiirritation and ulcer-inhibitory amount of inositol.

4,559,327

PHARMACEUTICAL COMPOSITION CONTAINING PARA-AMINOBENZOIC ACID-N-L-RHAMNOSIDE AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Tokyo; Takayoshi Fujii, Tokyo; Minoru Ohhara, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 289,226, Aug. 3, 1981, which is a division of Ser. No. 102,535, Dec. 11, 1979, Pat. No. 4,313,939, which is a continuation-in-part of Ser. No. 39,218, May 15, 1979, abandoned. This application Apr. 13, 1983, Ser. No. 484,592
Claims priority, application Japan, May 26, 1978, 53-63146; Dec. 29, 1978, 53-161385; Dec. 29, 1978, 53-161386
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.⁴ A61K *31/70*
U.S. Cl. 514—42 **10 Claims**

1. A pharmaceutical composition in dosage unit form which comprises a dosage of p-aminobenzoic acid-N-L-rhamnoside

or pharmaceutically acceptable salt thereof effective for the treatment of hyperglycemia.

4,559,328

NON-STEROIDAL ANTI-INFLAMMATORY COMPOUNDS TO TREAT INFLAMMATION

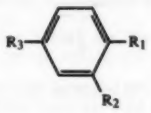
Richard V. Smerbeck, Hackettstown, and Eugene P. Pittz, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 21, 1984, Ser. No. 623,271

Int. Cl.[4] A61K *31/05, 31/015, 31/19, 31/60, 31/075*

U.S. Cl. 514—159 **12 Claims**

1. A method for the treatment of inflammation in mammals comprising adminstering a therapeutically effective amount of the compound having the formula:



wherein

R_1 is methoxy, hydroxymethyl, carboxylic acid, phenyl, hydroxy or hydroxamic acid,

R_2 is hydrogen, hydroxy or sulfhydryl, and

R_3 is hydrogen or hydroxy.

4,559,329

DIETARY AND PHARMACEUTICAL USES OF METHYL-SULFONYLMETHANE AND COMPOSITIONS COMPRISING IT

Robert J. Herschler, 3080 NW. 8th Ave., Camas, Wash. 98607

PCT No. PCT/US83/01396, § 371 Date Apr. 17, 1984, § 102(e) Date Apr. 17, 1984

Continuation-in-part of Ser. No. 418,110, Sep. 14, 1982, and a continuation-in-part of Ser. No. 277,592, Jun. 26, 1981, Pat. No. 4,477,469, which is a division of Ser. No. 71,068, Aug. 30, 1979, Pat. No. 4,296,130. This PCT application Sep. 13, 1983, Ser. No. 601,771

Int. Cl.[4] A61K *31/42, 31/43, 31/44, 31/135, 31/605, 31/10, 31/19, 31/34, 31/40*

U.S. Cl. 514—164 **11 Claims**

1. A pharmaceutical composition adapted for oral ingestion comprising a mixture of (a) gastrointestinal upset-promoting but otherwise physiologically acceptable pharmaceutically-active agent selected from the group consisting of analgesics, anti-neoplastic agents, anti-inflammatory agents, cardiovascular agents, antibiotics and other chemotherapeutants for microbial diseases, and (b) a gastrointestinal upset-ameliorating effective amount from about 100 to 1,000 mg of methylsulfonymethane.

4,559,330

USE OF 3,3'-AZO-BIS-(6-HYDROXY BENZOIC ACID) AS A DRUG AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Karl H. Agback; Tore Natvig, both of Uppsala, Sweden, and Sidney C. Truelove, Kirtlington, England, assignors to Pharmacia AB, Uppsala, Sweden

Filed Mar. 25, 1981, Ser. No. 247,252

Claims priority, application Sweden, Mar. 26, 1980, 8002322

Int. Cl.[4] A61K *31/655*

U.S. Cl. 514—166 **13 Claims**

1. A method of treating inflammatory intestinal diseases, comprising administering to a patient in a need thereof therapeutically effective amount of 3,3'-azo-bis-(6-hydroxy benzoic acid) or a pharmaceutically acceptable salt thereof.

4,559,331

7α-SUBSTITUTED 3-OXO-17α-PREGN-4-ENE-21,17-CARBOLACTONES, PROCESS FOR THEIR PRODUCTION, AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME

Klaus Nickisch; Henry Laurent; Peter Esperling; Dieter Bittler; Rudolf Wiechert, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

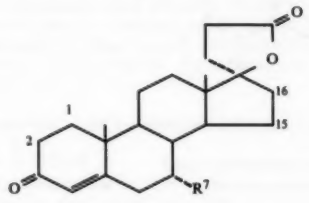
Filed Aug. 17, 1984, Ser. No. 641,599

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3330086; Aug. 17, 1983, 3330084; Aug. 17, 1983, 3330085

Int. Cl.[4] A61K *31/58*

U.S. Cl. 514—173 **32 Claims**

1. A 7α-substituted 3-oxo-17α-(pregn-4-ene-21,17-carbolactone of the formula

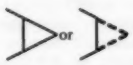


wherein

is a CC single bond, a CC double bond, or

R^7 is SR', wherein R' is hydrogen, C_{1-6}-alkyl or C_{1-6}-alkyl substituted by hydroxy or C_{1-4}-alkanoyloxy, or COR'', wherein R'' is C_{1-4}-alkyl; and

is a CC single bond,



26. A method of treating an indication in a patient which is treatable by achieving an antialdosterone effect in the patient, comprising administering to the patient an amount of a compound of claim 1 effective to achieve an antialdosterone effect.

4,559,332

20-SPIROXANES AND ANALOGUES HAVING AN OPEN RING E, PROCESSES FOR THEIR MANUFACTURE, AND PHARMACEUTICAL PREPARATIONS THEREOF

Jürgen Grob, Giebenach, and Jaroslav Kalvoda, Binningen, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

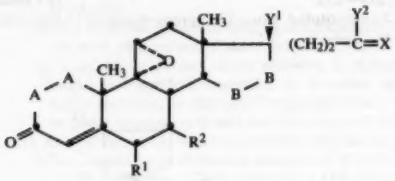
Filed Apr. 9, 1984, Ser. No. 598,109

Claims priority, application Switzerland, Apr. 13, 1983, 1981/83

Int. Cl.⁴ A61K *31/585*

U.S. Cl. 514—175 **17 Claims**

1. A steroid compound of the formula



(I)

in which

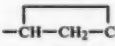
—A—A— represents the group —CH_2—CH_2— or —CH=CH—,

R^1 represents hydrogen, and

R^2 represents an α-oriented lower alkoxycarbonyl radical, or

R^1 and R^2 together represent an α- or a β-oriented methylene radical,

—B—B— represents the group —CH_2—CH_2— or an α- or β-oriented group



X represents two hydrogen atoms or oxo,

Y^1 and Y^2 together represent the oxygen bridge —O—, or

Y^1 represents hydroxy, and

Y^2 represents hydroxy, lower alkoxy or, if X represents H_2, also lower alkanoyloxy,

and salts of compounds in which X represents oxo and Y^2 represents hydroxy.

17. A therapeutic method for controlling hyperaldosteronism in humans and other warm blooded animals, comprising the simultaneous administration of an effective amount of a compound according to claim **1**, together with at least one diuretic which is non-specific with regard to electrolytes and which increases diuresis by renal and by extrarenal action on tissue.

4,559,333

HYDRAZONE SUBSTITUTED PENEMS

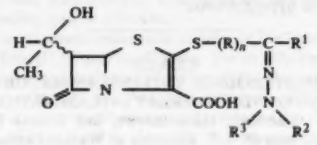
Vlyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Richard W. Versace, Ringwood, and Naginbhai M. Patel, Kearny, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 1, 1984, Ser. No. 585,314

Int. Cl.⁴ C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **10 Claims**

1. Compounds represented by the formula



and pharmaceutically acceptable salts and pharmaceutically acceptable esters thereof, in racemic or optically active forms, wherein

n is one or two;

R represents

wherein R^4 and R^5 are independently selected from hydrogen, lower alkyl, hydroxy-lower alkyl, halo-lower alkyl, amino-lower alkyl, carbamido-lower alkyl, cyano-lower alkyl, carbamoyloxy-lower alkyl, carbamoyl-lower alkyl, carboxy-lower alkyl, heterocyclyl-lower alkyl wherein the heterocyclic moiety has 5 or 6 ring atoms, at least one of which is carbon, and the remaining 4 or 5 ring atoms are independently selected from carbon, nitrogen, oxygen and sulfur; or R^4 and R^5 taken together are =O;

R^1 represents hydrogen, lower alkyl, hydroxy-lower alkyl, amino-lower alkyl, carboxy-lower alkyl, carbamoyloxy-lower alkyl, carbamoyl-lower alkyl, halololoweralkyl, cyano-lower alkyl, heterocyclic or heterocyclyl-lower alkyl wherein the heterocyclic moiety has 5 or 6 ring atoms, at least one of which is carbon, and the remaining ring atoms are independently selected from oxygen, carbon nitrogen and sulfur;

R^2 and R^3 independently represent hydrogen, carbamoyl, lower alkyl, carboxy-loweralkyl, hydroxy-lower alkyl, amino-lower alkyl, imidazolyl-lower alkyl, triazolyl-lower alkyl, tetrazolyl-lower alkyl, pyridinium-lower alkyl, aryl or R^2 and R^3 together with the N to which they are attached are a heterocyclic of 5 or 6 ring atoms, at least one of which is carbon and the remaining ring atoms are independently selected from carbon and nitrogen, wherein said heterocyclic moiety is unsubstituted or substituted with lower alkyl, hydroxy-lower alkyl, amino-lower alkyl, carboxy-lower alkyl, carboxyl, amino, hydroxy, imidazole-lower alkyl, triazole-lower alkyl, tetrazole-lower alkyl or pyridinium-lower alkyl.

4,559,334

7-SUBSTITUTED-3-VINYL-3-CEPHEM COMPOUNDS AND PROCESSES FOR PRODUCTION OF THE SAME

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

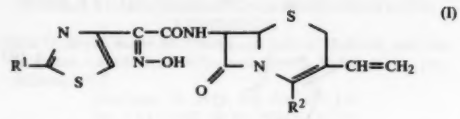
Continuation-in-part of Ser. No. 428,970, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 205,334, Nov. 10, 1980, Pat. No. 4,409,214. This application Oct. 20, 1983, Ser. No. 543,880

Claims priority, application United Kingdom, Aug. 26, 1983, 8323034

Int. Cl.⁴ C07D *501/24;* **A61K** *31/545*

U.S. Cl. 514—202 **20 Claims**

1. A syn isomer of the compound of the formula:



(I)

in which

R^1 is amino or a protected amino group, and

R^2 is carboxy or a protected carboxy group,

and a pharmaceutically acceptable salt thereof.

4,559,335

3-ACYLAMINO-1-CARBOXYMETHYLOXY (OR THIO) CARBONYL-2-AZETIDINONES

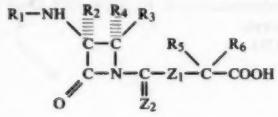
Robert Zahler, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 3, 1983, Ser. No. 538,720

Int. Cl.[4] **C07D** *205/08, 403/12, 401/12;* **A61K** *31/395*

U.S. Cl. 514—210 **15 Claims**

1. A compound having the formula



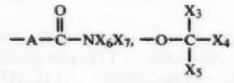
or a pharmaceutically acceptable ester or basic salt thereof, wherein

Z_1 and Z_2 are each independently oxygen or sulfur;

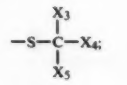
R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

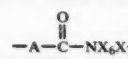
R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, $—CH_2X_1$, carboxyl, $—S—X_2$, $—O—X_2$,



or

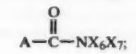


wherein X_1 is azido, amino, hydroxy, carboxyl, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)-sulfonyloxy, phenyl, substituted phenyl, cyano,



$—S—X_2$ or $—O—X_2$; X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $—CH=CH—$, $—(CH_2)_n—$, $—CH_2—O—$, $—CH_2—NH—$ or $—CH_2—S—CH_2—$; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle; and

R_5 and R_6 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, phenyl, substituted phenyl, cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or R_5 and R_6 together with the carbon atom to which they are attached are cycloalkyl or a 4, 5, 6 or 7-membered heterocycle, or $=CX_8X_9$ wherein X_8 and X_9 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or one of R_5 and R_6 is hydrogen and the other is halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2—X_1$, $—S—X_2$, $—O—X_2$, or



wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the terms "cycloalkyl" and "cycloalkenyl" refer to groups having 3, 4, 5, 6 or 7 carbon atoms:

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, aminocarbonyl, or carboxyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, or tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbons, groups;

the term "a 4,5,6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or to one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, or substituted alkyl, wherein the alkyl group has 1 to 4 carbons, groups;

the term "substituted amino" refers to a group having the formula $—NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

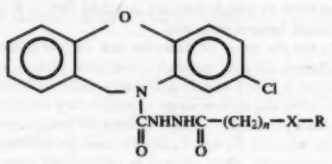
4,559,336

8-CHLORODIBENZ[B,F][1,4]OXAZEPINE-10(11H)-CARBOXYLIC ACID, 2-(SULFINYL- AND SULFONYL-CONTAINING ACYL)HYDRAZIDES

Richard A. Mueller, Glencoe, Ill., assignor to G.D. Searle & Co., Skokie, Ill.

Filed Feb. 25, 1985, Ser. No. 705,279
Int. Cl.[4] C07D 267/20; A61K 31/55
U.S. Cl. 514—211 **20 Claims**

1. A compound of the formula:



wherein X is SO or SO_2;

wherein R is alkyl containing from 1 to 6 carbon atoms, inclusive; and

wherein n is an integer from 1 to 4, inclusive.

15. A method for treating pain in mammals comprising administering a therapeutically effective amount of at least one compound of claim **1** to a mammal in need of such treatment.

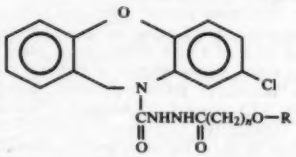
4,559,337

8-CHLORODIBENZ[B,F][1,4]OXAZEPINE-10(11H)-CARBOXYLIC ACID, 2-(ALKOXY-CONTAINING ACYL)HYDRAZIDES

Richard A. Mueller, Glencoe, Ill., assignor to G.D. Searle & Co., Skokie, Ill.

Filed Feb. 25, 1985, Ser. No. 705,280
Int. Cl.[4] C07D 267/20; A61K 31/55
U.S. Cl. 514—211 **17 Claims**

1. A compound of the formula:



wherein R is:

(a) alkyl containing from 1 to 6 carbon atoms, inclusive; or

(b) alkoxyalkyl containing from 2 to 6 carbon atoms, inclusive; and

wherein n is an integer of 1 to 4, inclusive.

13. A method for treating pain in mammals comprising administering a therapeutically effective amount of at least one compound of claim **1** to a mammal in need of such treatment.

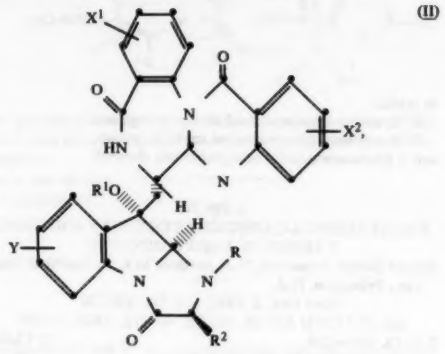
4,559,338

SOLUBLE QUINAZOLINO-1,4-BENZODIAZEPIN-5,13-DIONE DERIVATIVES

Mark G. Bock; Roger M. Freidinger, both of Hatfield, and Ben E. Evans, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 25, 1985, Ser. No. 695,117
Int. Cl.[4] C07D 403/14; A61K 31/55
U.S. Cl. 514—219 **18 Claims**

1. Quinazolino-1,4-benzodiazepin-5,13-dione derivatives of the formula:

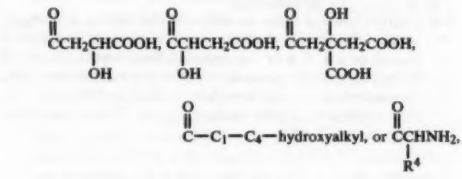


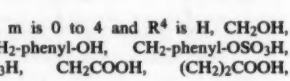
(II)

wherein:

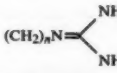
X^1, X^2 and Y are independently H, Br, Cl, F, OH, O—C_1–C_4-alkyl or C_1–C_4-alkyl;

R is H, $(CH_2)_nCOOH$,





where n is 1 to 4, m is 0 to 4 and R^4 is H, CH_2OH, $CHOHCH_3$, CH_2-phenyl-OH, CH_2-phenyl-OSO_3H, CH_2-phenyl-OPO_3H, CH_2COOH, $(CH_2)_2COOH$, $(CH_2)_mNH_2$ or



R^1 is R, such that if R is H, then R^1 is not H, and if R is not H, then R^1 is H;

R^2 is H, C_1–C_4-straight- or branched-chain alkyl; CH_2R^5, where R^5=hydroxy-C_1–C_4-alkyl or CH_2SCH_3; or CH_2-unsubstituted or monosubstituted phenyl, where the substituent is OH or OSO_3H;

is a single or double bond,

or pharmaceutically-acceptable salts of these compounds.

16. A method of preventing or treating a mammal for disorders of the gastrointestinal, central nervous or appetite regulatory systems which comprises administering to said mammal a pharmaceutically-effective amount of one or more quinazolino-1,4-benzodiazepin-5,13-dione derivatives or pharmaceutically -acceptable salts thereof, according to claim **1**.

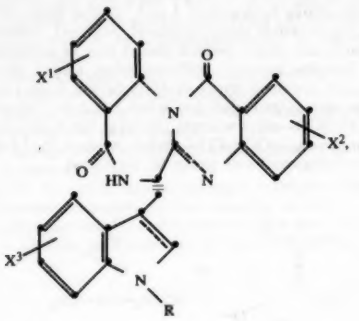
4,559,339

INDOL-3-YL-QUINAZOLINO-1,4-BENZODIAZEPIN-5,13-DIONES

Mark G. Bock; Roger M. Freidinger, both of Hatfield, and Ben E. Evans, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 25, 1985, Ser. No. 695,118
Int. Cl.[4] A61K *31/55*; C07D *403/14*
U.S. Cl. 514—219 **17 Claims**

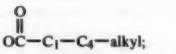
1. An indol-3-yl-quinazolino-1,4-benzodiazepin-5,13-dione of the formula:



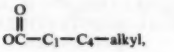
(II)

wherein:

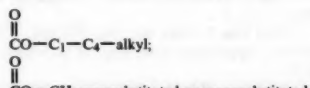
X^1, X^2 and X^3 are independently H, Br, Cl, F, OH, C_1–C_4-alkyl, O—C_1–C_4-alkyl or



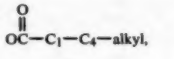
R is H; C_1–C_8-straight- or branched-chain alkyl; C_3–C_8-cyclic alkyl; C_1–C_8-straight- or branched-chain aralkyl, where the aryl is phenyl or naphthyl, which is unsubstituted or is monosubstituted on the aromatic ring by Br, Cl, F, OH, O—C_1–C_4-alkyl,



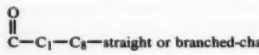
C_1–C_4-alkyl, NO_2, NH_2, CN or CF_3;

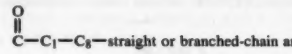


where the substituent is Br, Cl, F, OH, O—C_1–C_4-alkyl,

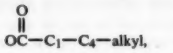


NO_2, CN, C_1–C_4-alkyl, or CF_3;

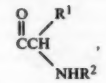




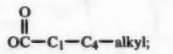
where the aryl is phenyl or naphthyl, which is unsubstituted or is monosubstituted on the aromatic ring by Br, Cl, F, OH, O—C_1–C_4-alkyl,



C_1–C_4-alkyl, NO_2, NH_2, CN or CF_3;

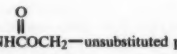


where R^1 is H; C_1–C_4-straight or branched-chain alkyl; CH_2-unsubstituted or monosubstituted phenyl, wherein the substituent is Br, Cl, F, OH, O—C_1–C_4-alkyl, O—CH_2-phenyl, or



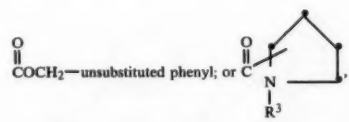
CH_2-3-indole; CH_2-imidazole; $CH_2CH_2SCH_3$;

hydroxy-C_1–C_4-alkyl; $(CH_2)_nNH_2$; or



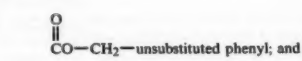
wherein n is 1 to 4; and R^2 is H,

or



where R^3 is H,

or



is a saturated (single) unsaturated (double) bond; or pharmaceutically-acceptable salts of these compounds.

4,559,340

ANTIHYPERTENSIVE AGENTS

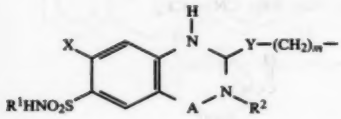
Bernard R. Neustadt, West Orange; David R. Andrews, Bloomfield, and Paul E. McNamara, Westfield, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Nov. 25, 1983, Ser. No. 555,311

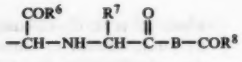
Int. Cl.[4] C07D *417/12*; A61K *31/54*

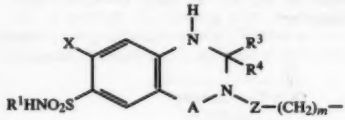
U.S. Cl. 514—222 **18 Claims**

1. A compound represented by the formulae

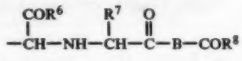


I





II

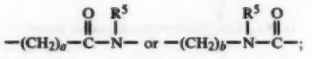


wherein

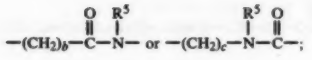
A is $-SO_2-$

X is Cl or CF_3;

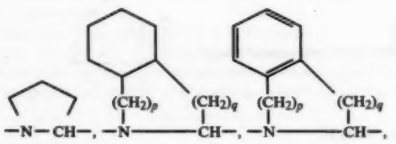
Y is



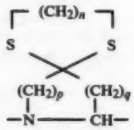
Z is



B is



IIIa IIIb IIIc



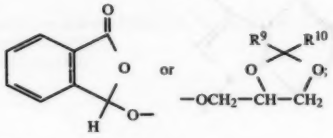
IIId

R^1 is hydrogen or lower alkyl;

R^2 and R^5 are independently hydrogen, lower alkyl, phenyl, or phenyl(lower)alkyl;

R^3 and R^4 are independently hydrogen, lower alkyl, halo lower alkyl, phenyl, or phenyl(lower)alkyl, or R^3 and R^4 taken together with the carbon to which they are attached can form a 5–7 membered cycloalkyl ring;

R^6 and R^8 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, $L—Q_r—(CH_2)_s—O—$, wherein L is phenyl, substituted phenyl, 1-naphthyl or 2-naphthyl; Q is oxygen or sulfur; r is 0 or 1 and s is 0 to 4; and wherein the substituents on the substituted phenyl are chosen from group M, wherein M is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, alkyl from 1 to 6 carbon atoms, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl, and phenyl (which phenyl may be substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms), provided that when s is zero, r is zero; $—OCH_2OCO—$alkyl wherein the alkyl has from 3 to 8 carbon atoms, $—OCH_2CO—$phenyl, wherein the phenyl may be substituted with group M, 1-gylceryl,



R^7 is hydrogen, lower alkyl, or aminoloweralkyl;

R^9 is hydrogen, lower alkyl, phenyl, or phenyl substituted by group M;

R^{10} is hydrogen or lower alkyl;

a is 0–8;

b is 1–8;

c is 2–8;

m is 1–4;

n is 0 or 1;

p and q are each 0,1 or 2, provided that in formulae IIIb and IIIc the sum of p and q is 1 or 2, and that in formula IIId p is not 0; and pharmaceutically acceptable salts thereof.

4,559,341

QUINOLONECARBOXYLIC ACIDS AND ANTIBACTERIAL AGENTS CONTAINING THESE COMPOUNDS

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Engelbert Kühle, Bergisch-Gladbach; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

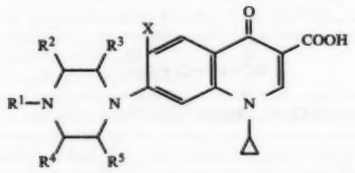
Filed Feb. 3, 1984, Ser. No. 576,595

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306771

Int. Cl.[4] A61K *31/495*; C07D *401/04, 401/14*

U.S. Cl. 514—254 **15 Claims**

1. A quinolonecarboxylic acid of the formula (I)



(I)

in which

R^1 denotes $CO—R^6$, CN, $SO_2—R^7$, $S—R^8$,

R^6 denotes hydrogen, straight-chain or branched alkyl which has 1 to 5 C atoms and is optionally substituted by 1 to 3 substituents selected from the group from the series consisting of amino, chlorine, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl part, carboxyl, alkoxy having 1 to 4 carbon atoms, hydroxyl and trifluoromethylthio, phenyl which is optionally substituted by 1 to 5 substituents selected from the group consisting of fluorine, chlorine, hydroxyl, methoxy, amino and carboxyl, benzyl which is optionally substituted by amino, alkoxy or alkylthio which has 1 to 5 C atoms and is optionally substituted by fluorine, chlorine, pyrazol-1-yl, 1,2,3-triazol-1-yl or N-oxido-2-, -3- or -4-pyridyl-methyl, benzyloxy, amino, alkylamino which has 1 to 5 C atoms and is optionally substituted by alkoxycarbonyl having 1 to 3 C atoms in the alkyl part or by benzyloxycarbonyl or carboxyl, or phenylamino,

R^7 denotes straight-chain or branched alkyl which has 1 to 4 C atoms and is optionally substituted by 1 to 3 substituents selected from the group consisting of fluorine and amino, or phenyl or methylphenyl,

R^8 denotes methoxycarbonyl, trichloromethyl or dichlorofluoromethyl,

R^2, R^3, R^4 and R^5 denote hydrogen, methyl or ethyl and

X denotes hydrogen, fluorine, chlorine or nitro

or a pharmaceutically usable acid addition salts, alkali metal salt or alkaline earth metal salt of hydrate thereof.

4,559,342

QUINOLONE ACIDS AND ANTIBACTERIAL AGENTS CONTAINING THESE COMPOUNDS

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

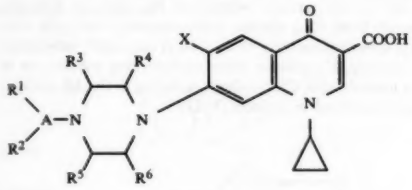
Filed Feb. 3, 1984, Ser. No. 576,596

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306772

Int. Cl.[4] A61K *31/495;* **C07D** *401/04*

U.S. Cl. 514—254 **15 Claims**

1. A quinolonecarboxylic acid of the formula (I),



(I)

in which

A denotes straight-chain or branched alkylene with 1 to 5 C atoms or >C=CH—,

R^1 denotes alkoxycarbonyl with 1 to 5 C atoms in the alkyl part, benzyloxycarbonyl, carboxyl, carbamoyl which is optionally substituted by 1 or 2 methyl or ethyl radicals, cyano, methylsulphonyl or ethylsulphonyl and

R^2 denotes hydrogen, alkoxycarbonyl with 1 to 5 C atoms in the alkyl part, benzyloxycarbonyl, carbamoyl, cyano, chlorine, acetyl, alkyl with 1 or 2 carbon atoms or phenyl, or

R^1 and R^2, together with the C atom which they substitute, can also form a 2-oxo-tetrahydrofuryl ring,

R^3, R^4, R^5 and R^6 denote hydrogen, methyl or ethyl and

X denotes hydrogen, fluorine or nitro,

and a pharmaceutically useful acid addition, alkali metal or alkaline earth metal salt/s or hydrate thereof.

14. A method of combating bacterial infection in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of a compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,559,343

NONIRRITATING AQUEOUS OPHTHALMIC COMPOSITIONS COMFORT FORMULATION FOR OCULAR THERAPEUTIC AGENTS

Wesley W. Han, Mansfield, and Robert E. Roehrs, Fort Worth, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Sep. 7, 1982, Ser. No. 415,758

Int. Cl.[4] A61K *31/52*

U.S. Cl. 514—264 **7 Claims**

1. An aqueous, nonirritating, nonsteroidal, ophthalmic composition for topical application to the eye comprising:

a therapeutically effective amount of suprofen for topical treatment of inflammation of the eye, and pharmaceutically acceptable salts thereof;

a xanthine derivative being present in an amount between the amount of derivative soluble in the water of said composition and 0.05% by weight/volume of said composition which is effective to reduce the discomfort associated with suprofen upon topical application of said composition, said xanthine derivative being selected from the group consisting of theophylline, caffeine, theobromine and mixtures thereof;

an ophthalmic preservative; and

a buffer, to provide an isotonic, aqueous, nonirritating nonsteroidal ophthalmic composition.

4,559,344

PYRIDINE-PYRIMIDINONE DERIVATIVES, A PROCESS FOR THEIR PRODUCTION AND H_2-ANTAGONIST MEDICAMENT CONTAINING THESE COMPOUNDS

Helmut Schickaneder, Eckental; Peter Mörsdorf, Cadolzburg; Stefan Postius, Nuremberg; Istvan Szelenyi, Schwaig; Rolf Herter; Herbert Hansen, both of Schwabach, and Kurt H. Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

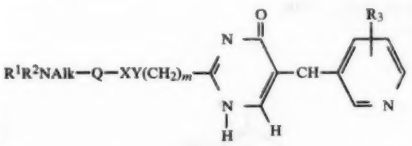
Filed Jan. 26, 1984, Ser. No. 574,077

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306102

Int. Cl.[4] A61K *31/505;* **C07D** *239/02*

U.S. Cl. 514—269 **35 Claims**

1. Pyridine-pyrimidinone compounds corresponding to the following formula



(I)

in which

R^1 represents linear C_{1-6} alkyl or cycloalkyl and

R^2 represents linear C_{1-6} alkyl or

R^1 and R^2 together with the nitrogen atom to which they are attached form a pyrrolidine or piperidine ring;

Alk represents a linear alkylene chain containing from 1 to 6 carbon atoms;

Q represents a benzene ring which is incorporated in the remainder of the molecule by bonds in the 1- and 3-position or in the 1- and 4-position, or

Q represents a furan ring which is incorporated into the

remainder of the molecule by bonds in the 2- and 5-position or

Q represents a thiophene ring which is incorporated into the remainder of the molecule by bonds in the 2- and 5-position or in the 2- and 4-position or

Q represents a thiazole ring which is incorporated into the remainder of the molecule by bonds in the 2- and 4-position;

X represents oxygen, Y is a single bond and m has the value 2, 3 or 4 where Q represents benzene;

X represents methylene, Y represents sulfur and m has the value 2 or 3 where Q is furan, thiophene or thiazole;

R^3 represents a hydrogen atom or a lower alkyl group; and physiologically compatible salts thereof.

31. 5-(6-methylpyrid-3-ylmethyl)-2-[3-[2-(1-piperidylmethyl)-thienyl-5-methylthio]-propyl]-pyrimidin-4-one and the physiologically compatible salts thereof.

4,559,345

PYRIMIDINE AND S-TRIAZINE DERIVATIVES WITH ANTILIPIDEMIC ACTIVITY

Piero Gomarasca, Cinisello Balsamo; Carlo Scolastico, and Cesare Sirtori, both of Milan, all of Italy, assignors to LBP Istituto Farmaceutico S.p.A., Milan, Italy

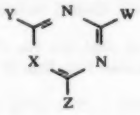
Filed Jul. 21, 1982, Ser. No. 400,434

Claims priority, application Italy, Aug. 20, 1981, 23580 A/81

Int. Cl.[4] **C07D** *239/46, 239/48, 251/18;* **A61K** *31/505*

U.S. Cl. 514—275 **7 Claims**

1. Compounds of formula I,



(I)

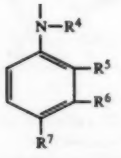
in which

X is CH;

Y is halogen;

W is Q—CH_2—COR;

Z is



Q is NH, N(CH_3);

R is OH, C_1–C_4 alkoxy, hydrazino or NR^8R^9;

R^4 is H or C_1–C_4 alkyl;

R^5 and R^6, which may be equal or different, are H or CH_3;

R^7 is H, C_1–C_4 alkoxy or CF_3;

R^8 and R^9, which may be equal or different, are H, C_1–C_4 alkyl, β-mercaptoethyl, or $(CH_2)_nOH$, where n=2–4.

4,559,346

CERTAIN N-OCTAHYDRO-INDOLIZINEBENZAMIDES AND THEIR USE IN TREATING PSYCHOSIS, CARDIAC ARRHYTHMIA AND HYPERTENSION

Francis D. King, Newport, England, assignor to Beecham Group p.l.c., Brentford, England

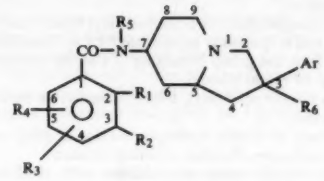
Filed Apr. 22, 1983, Ser. No. 487,904

Claims priority, application United Kingdom, Apr. 23, 1982, 8211882

Int. Cl.[4] **A61K** *31/445;* **C07D** *471/04*

U.S. Cl. 514—299 **17 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt or N-oxide thereof; or a solvate of any of the foregoing:



(I)

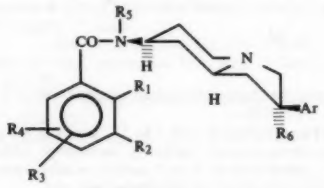
wherein:

R_1 is C_{1-6}alkoxy, C_{1-6}alkylthio or, together with R_5 is C_{1-2}alkylene, and one of R_2, R_3 and R_4 is hydrogen and the other two together are C_{1-2} alkylenedioxy, or the other two are the same or different and are selected from hydrogen, halogen, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-7}acyl, C_{1-7} acylamino, C_{1-6}alkylsulphonyl, C_{1-6}alkylsulphinyl hydroxy, nitro or amino, aminocarbonyl or aminosulphonyl optionally N-substituted by one or two C_{1-6}alkyl, C_{3-8} cycloalkyl, phenyl or phen C_{1-4}alkyl groups or optionally N-disubstituted by C_{4-5} polymethylene, or R_1 and R_2 together are C_{1-2} alkylenedioxy, and R_3 and R_4 together are C_{1-2} alkylenedioxy or R_3 and R_4 are the same or different and are selected from the previously defined class of substituents:

R_5 is hydrogen or as defined with R_1;

R_6 is hydrogen or C_{1-6} alkyl; and

Ar is phenyl or thien-2-yl or thien-3-yl, optionally substituted by one or two groups, which are the same or different, selected from C_{1-4} alkoxy, trifluoromethyl, halogen, carboxy, esterified carboxy or C_{1-4} alkyl optionally substituted by hydroxy, C_{1-4}alkoxy, carboxy, esterified carboxy or in vivo hydrolysable C_{1-4}acyloxy; Ar being in the 3β configuration as defined in formula (VIII)



(VIII)

and Ar may also have the 3α-configuration either when one of R_2, R_3 and R_4 is hydrogen and the other two are independently selected from optionally substituted amino or aminosulphonyl as defined, C_{1-6} alkylsulphonyl or C_{1-6} alkylsulphinyl; or when

R_1 and R_2 together are C_{1-2} alkylenedioxy and R_3 and R_4 are independently selected from the same group of substituents.

14. A method of treatment or prophylaxis of psychosis in mammals, such as humans, which comprises the administration of an effective amount of a compound according to claim 1, or

a pharmaceutically acceptable acid addition salt thereof, or a solvate of either of the foregoing.

4,559,347

3-SUBSTITUTED-5-ALKYL-1,6-NAPHTHYRIDIN-2(1H)-ONES, CARDIOTONIC USE AND PREPARATION THEREOF

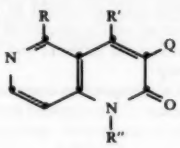
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 502,858, Jun. 9, 1983, Pat. No. 4,517,190, which is a continuation-in-part of Ser. No. 404,454, Aug. 2, 1982, Pat. No. 4,415,580. This application Oct. 11, 1984, Ser. No. 659,800

Int. Cl.[4] A61K *31/435;* C07D *471/04*

U.S. Cl. 514—300 14 Claims

1. 1-R"-3-Q-4-R'-5-R-1,6-naphthyridin-2(1H)-one having the formula



or acid-addition or cationic salt thereof, where R is lower-alkyl, R' is hydrogen or methyl, R" is hydrogen or lower-alkyl, and Q is cyano, carbamyl, carboxy or aminocarbamyl.

4,559,348

5- AND/OR 7-SUBSTITUTED PYRAZOLO-[4,3-b]-PYRIDINES AND THEIR USE AS ANTIINFLAMMATORY AGENTS

Jim Hurst, and Josephine B. May, both of Sunderland, England, assignors to Beecham Group, p.l.c., Brentford, England

Filed Mar. 7, 1984, Ser. No. 587,116

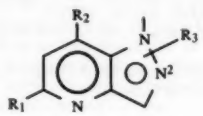
Claims priority, application United Kingdom, Mar. 9, 1983, 8306481; Oct. 29, 1983, 8328942

Int. Cl.[4] A61K *31/415;* C07D *471/04*

U.S. Cl. 514—303 11 Claims

1. A compound of the formula (I) and pharmaceutically acceptable salts thereof:

(I)



wherein:

the first of R_1 and R_2 is hydrogen, C_{1-4} alkyl or phenyl optionally substituted by one or two substituents selected from halogen, CF_3, C_{1-4} alkoxy or alkyl and the second is SR_4 wherein R_4 is phenyl optionally substituted by halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl, or NR_5R_6 wherein R_5 and R_6 are independently selected from hydrogen, C_{1-6} alkyl, C_{3-8} cycloalkyl, phenyl or phenyl C_{1-4} alkyl either of which phenyl moieties may be substituted by one or two substituents selected from halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl, or R_5 and R_6 together form C_{4-6} polymethylene; and

R_3 is hydrogen, C_{1-4} alkyl or benzyl and is attached at nitrogen atom 1 or 2.

9. An anti-inflammatory pharmaceutical composition, comprising an anti-inflammatory effective amount of compound according to claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,559,349

CARBOXAMIDES

Angelo Storni, Rheinfelden, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,493

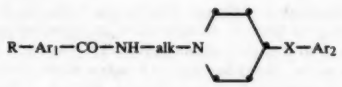
Claims priority, application Switzerland, Mar. 9, 1983, 1258/83; Jul. 18, 1983, 3925/83

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—318 17 Claims

1. N-(piperidinyl-alkyl)-carboxamides of the general formula

(I)



in which

R represents hydroxy, hydroxy etherified by an aliphatic alcohol, or halogen,

Ar_1 represents a monocyclic arylene or heteroarylene radical,

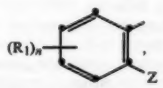
alk represents an alkylene group that separates the two N atoms by at least two carbon atoms,

X represents a free or ketalised carbonyl group, free hydroxymethylene or hydroxymethylene esterified by an organic carboxylic acid, or methylene, and

Ar_2 represents a monocyclic aryl or heteroaryl radical,

and salts thereof, with the proviso that the grouping $R—Ar_1$ is other than a radical of the formula

(Ia)



in which R_1 is selected from the group consisting of lower alkyl, trifluoromethyl, halogen, lower alkoxy, nitro and cyano and at least one of the radicals R_1 represents halogen or lower alkoxy, n represents an integer from 1 to 3, and Z represents nitro, amino, lower alkylamino, arylamino, aryl-lower alkylamino, (thio-)formylamino, (thio-)lower alkanoylamino, (thio-)aroylamino or aryl-(thio-)lower alkanoylamino, if alk and X have the meanings given and Ar_2 represents unsubstituted phenyl, thienyl or pyridyl or substituted phenyl having one, two or three substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, trifluoromethyl and amino.

4,559,350

ANTIHYPERTENSIVE TETRAHYDROPYRIDINE 3-CYANO 5-CARBOXYLIC ACID ESTERS

Egbert Wehinger; Stanislav Kazda, and Andreas Knorr, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

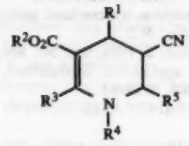
Division of Ser. No. 538,683, Oct. 3, 1983. This application Aug. 24, 1984, Ser. No. 644,093

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239273

Int. Cl.[4] C07D *211/90, 401/12, 405/02;* A61K *31/455*

U.S. Cl. 514—332 10 Claims

1. A 1,2,3,4-tetrahydropyridine of the formula



in which

R^1 represents phenyl or naphthyl optionally substituted by 1 or 2 identical or different substituents from the group consisting of phenyl, straight-chain or branched alkyl having 1 to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, alkoxy having 1 to 4 carbon atoms, tri-tetra- and pentamethylene, dioxamethylene, halogen, trifluoromethyl, trifluoro-methoxy, difluoromethoxy, tetrafluoroethoxy or cyano,

R^2 represents a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical having up to 20 carbon atoms, which is optionally interrupted by one oxygen or sulphur atom in the chain and/or which is optionally substituted by halogen, cyano, hydroxyl, α-, β- or γ-pyridyl, phenyl, phenoxy or phenylthio, it being possible for the phenyl groups to be substituted by halogen, cyano, dialkylamino having 1 to 4 carbon atoms in each alkyl radical, alkoxy having 1 to 4 carbon atoms, alkyl having 1 to 4 carbon atoms, trifluoromethyl or trifluoromethoxy, or by an amino group which in turn is substituted by two identical or different substituents from the group consisting of alkyl having 1 to 4 carbon atoms, phenyl or benzyl,

R^3 and R^5, which are identical or different, each represent hydrogen, a straight-chain or branched alkyl radical having up to 4 carbon atoms, a phenyl radical or a benzyl radical, and R^4 represents hydrogen, a straight-chain or branched alkyl radical having up to 4 carbon atoms which is optionally interrupted by an oxygen atom, a phenyl radical or a benzyl radical, or a salt thereof with a physiologically tolerated acid.

7. An antihypertensive composition which consists of an amount of a compound of claim 1 effective in the treatment of hypertension, and a pharmaceutically acceptable carrier.

4,559,351

DIHYDROPYRIDINE DERIVATIVES OF 1,4:3,6-DIANHYDROHEXITOLS

Peter Stoss, Illertissen, and Matyas Leitold, Biberach, both of Fed. Rep. of Germany, assignors to Heinrich Mack Nachf., Illertissen, Fed. Rep. of Germany

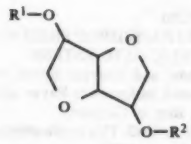
Continuation-in-part of Ser. No. 556,737, Nov. 30, 1983, abandoned. This application Jun. 26, 1984, Ser. No. 624,642

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248548

Int. Cl.[4] C07D *493/00*; A61K *31/455*

U.S. Cl. 514—338 **11 Claims**

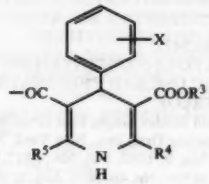
1. A compound of the general formula



or a pharmaceutically acceptable salt thereof, wherein:

R^1 is hydrogen, lower acetyl having 2 to 5 carbon atoms, pyridylcarbonyl or nitro;

R^2 is a 1,4-dihydropyridylcarbonyl radical of the general formula



X is hydrogen, 1,2 or 3 of the same of different substituents selected from the group consisting of alkoxy, alkyl, cyano, dialkylamino, halogen, nitro and trifluoromethyl, or methylenedioxy;

R^3 is a saturated or unsaturated hydrocarbon radical having 1 to 5 carbon atoms optionally interrupted by an oxygen atom, or the hydrocarbon radical or the oxygen-interrupted hydrocarbon radical substituted by cyano; and

R^4 and R^5 are the same or different and are in each case a lower alkyl group.

9. A pharmaceutical composition comprising an antihypertensive effective amount of a compound according to claim 1 and a pharmaceutically accceptable carrier or additive.

4,559,352

1,2-DIHYDRO-2-OXO-5-(HYDROXY-AND/OR AMINO-PHENYL)-NICOTINONITRILES AND CARDIOTONIC USE THEREOF

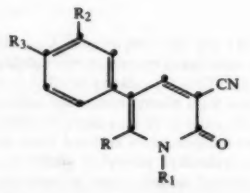
George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 355,229, Mar. 5, 1982, Pat. No. 4,515,797, which is a continuation-in-part of Ser. No. 300,294, Sep. 8, 1981, abandoned, and a continuation-in-part of Ser. No. 348,450, Feb. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 248,840, Mar. 30, 1981, abandoned. This application Jul. 30, 1984, Ser. No. 635,947

Int. Cl.[4] A61K *31/44*; C07D *311/02*

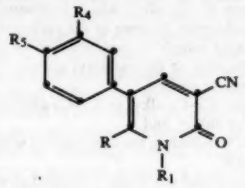
U.S. Cl. 514—344 **12 Claims**

1. A 1-R_1-1,2-dihydro-2-oxo-5-(3-R_2-4-R_3-phenyl)-6-R-nicotinonitrile having the formula



or acid-addition salt thereof, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is hydrogen or lower-alkyl, R_2 is hydrogen, amino or nitro and R_3 is hydroxy.

7. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable carrier and, as the active component thereof, a cardiotonically effective amount of 1-R_1-1,2-dihydro-2-oxo-5-(3-R_4-R_5-phenyl)-6-R-nicotinonitrile of the formula



or pharmaceutically acceptable acid-addition salt thereof, where R_1 is hydrogen, lower-alkyl or lower-hydroxyalkyl, R is hydrogen or lower-alkyl, and, R_4 and R_5 are each hydrogen, amino or hydroxy, at least one of R_4 and R_5 being other than hydrogen or where R_4 is nitro and R_5 is hydroxy.

10. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonic composition according to claim 7.

4,559,353

INSECTICIDALLY ACTIVE 2,6-DISUBSTITUTED BENZIMIDATE DERIVATIVES

Michael D. Turnbull, Berkshire, England, assignor to Imperial Chemical Industries PLC, London

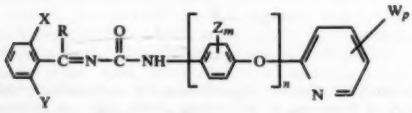
Filed Nov. 1, 1983, Ser. No. 547,629

Claims priority, application United Kingdom, Nov. 5, 1982, 8231696

Int. Cl.⁴ A01N *43/40;* **C07D** *213/64*

U.S. Cl. 514—346 **8 Claims**

1. A compound of formula:



wherein X and Y are independently selected from fluorine, chlorine, methyl or methoxy and one of X and Y may additionally be hydrogen; R is alkoxy of up to 6 carbon atoms, mono or dialkylamino of up to 4 carbon atoms in the alkyl moiety, or alkoxyamino of up to 4 carbon atoms; m and p are independently selected from 1 to 4 and each W and each Z are independently selected from hydrogen, halo and haloalkyl containing 1 or 2 carbon atoms; and n is one.

4,559,354

CERTAIN ANTIHYPERTENSIVE 1-[2-[3-CARBAMOYL-4-HYDROXY PHENOXY]ALKYLENE AMINO]-HETEROCYCLIC PHENOXY-PROPANOL DERIVATIVES

Walter Fuhrer, Frenkendorf; Franz Ostermayer, and Markus Zimmermann, both of Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

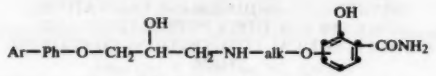
Continuation of Ser. No. 259,323, Apr. 30, 1981, abandoned. This application May 6, 1983, Ser. No. 490,211

Claims priority, application Switzerland, May 9, 1980, 3655/80

Int. Cl.⁴ C07D *213/38, 307/52, 333/20;* **A61K** *31/44*

U.S. Cl. 514—357 **10 Claims**

1. A compound of the formula



in which:

Ar represents pyrrolyl, imidazolyl, triazolyl, pyridyl, or dihydro-6-oxo-pyridyl substituted by lower alkyl, hydroxy lower alkyl, halo lower alkyl, lower alkylthio, lower alkylsulphonyl, lower alkanoyl and lower alkoxy carbonyl;

Ph represents 1,4-phenylene optionally substituted by lower alkyl or halogen;

alk represents an alkylene radical having 2 or 3 carbon atoms, the adjacent nitrogem atom and the adjacent oxygen atom being separated from each other by 2 or 3 carbon atoms; and the N-oxides or salts thereof.

10. A method for the treatment of cardiac muscle insufficiency in a warm-blooded animal in need of such treatment which comprises the administration thereto of a therapeutically active amount of a compound of the formula I as defined in claim 1 or a pharmaceutically acceptable non-toxic addition salt thereof.

4,559,355

2-ARYL-2-AZOLYLMETHYL-1,3-DIOXEPINE FUNGICIDES

Udo Krautz; Gerhard Jäger, both of Leverkusen; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen; Paul Reinecke, Leverkusen; Hans-Dieter Scharf, Roetgen, and Herbert Frauenrath, Aachen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

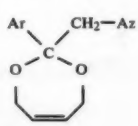
Filed Aug. 12, 1983, Ser. No. 522,939

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232737

Int. Cl.⁴ A01N *43/50, 43/64;* **C07D** *405/06;* **C07F** *1/00*

U.S. Cl. 514—383 **8 Claims**

1. A 2-aryl-2-azolylmethyl-1,3-dioxepine of the formula



in which

Az is imidazol-1-yl or 1,2,4-triazol-1-yl, and

Ar is phenyl optionally substituted by halogen, cyano, nitro, alkyl, alkoxy or alkylthio with in each case 1 to 4 carbon atoms, halogenalkyl, halogenalkoxy or halogenalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 halogen atoms, dialkylamino, acetamido, N-methylacetamido, alkoxycarbonyl, alkoxycarbonylamino or N-alkyl-alkoxycarbonylamino with in each case 1 to 4 carbon atoms in the particular alkyl parts, or phenyl or phenoxy which is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms,

or an addition product thereof with an acid or metal salt.

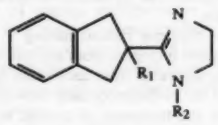
6. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim 1 in admixture with a diluent.

4,559,356
2-(INDEN-2-YL)-IMIDAZOLINE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Dennis Bigg, and Jacques Menin, both of Paris, France, assignors to Synthelabo, Paris, France

Filed Mar. 16, 1984, Ser. No. 590,355
Claims priority, application France, Mar. 18, 1983, 83 04524
Int. Cl.[4] A01K *31/415;* **C07D** *233/06, 233/22*
U.S. Cl. 514—401 **3 Claims**

1. Compounds of the general formula (I)



(I)

in which R_1 is a hydrogen atom or a (C_1–C_4)-alkyl, benzyl, phenethyl or methoxy group and R_2 is a hydrogen atom or a methyl group, and their pharmaceutically acceptable acid addition salts.

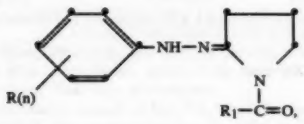
3. A pharmaceutical composition for use as an α_2-antagonist which comprises, as active ingredient, an α_2-antagonistically effective amount of a compound or salt as claimed in claim 1 in association with a suitable excipient.

4,559,357
INSECTICIDAL AND ACARICIDAL PHENYLHYDRAZONO- AND PHENYLHYDRAZINO-PYRROLIDINES

Jean-Claude Gehret, Aesch, and Walter Traber, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

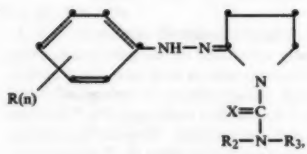
Filed Jun. 6, 1983, Ser. No. 501,456
Claims priority, application Switzerland, Jun. 11, 1982, 3639/82; Jun. 11, 1982, 3641/82; Aug. 26, 1982, 5079/82
Int. Cl.[4] A01N *43/36;* **C07D** *207/14, 207/22*
U.S. Cl. 514—423 **11 Claims**

1. A substituted phenylhydrazone or phenylhydrazine compound of the formula Ia

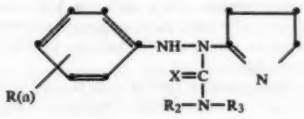


(Ia)

or of the formula Ib or Ic



(Ib)



(Ic)

wherein

R is C_1–C_4-alkyl or halogen,
R_1 is hydrogen, C_1–C_6-alkyl which is unsubstituted or substituted by chlorine, fluorine or the carboxyl group, or it is C_2–C_6-alkenyl which is unsubstituted or substituted by chlorine, fluorine or the carboxyl group,
R_2 is hydrogen or methyl,
R_3 is hydrogen, C_1–C_4-alkyl or C_2–C_4-alkenyl,
X is oxygen or sulfur, and
n is zero or 1–5, including the salts thereof with inorganic or organic acids.

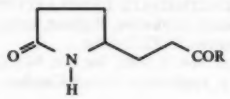
6. An insecticidal and acaricidal composition which contains as active ingredient an insecticidally or acaricidally effective amount of at least 1 compound of the formula Ia, Ib or Ic according to claim 1, together with an inert carrier.

4,559,358
5-OXO-2-PYRROLIDINEPROPANOIC ACID AND DERIVATIVES FOR REVERSING ELECTROSHOCK AMNESIA

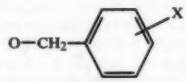
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 381,662, May 24, 1982, abandoned. This application Mar. 24, 1983, Ser. No. 476,524
Int. Cl.[4] C07D *207/26;* **A61K** *31/40*
U.S. Cl. 514—424 **13 Claims**

1. A compound having the structural formula

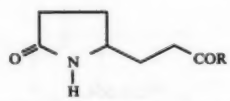


wherein R is

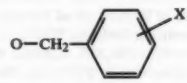


wherein X is hydrogen, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halo, or trifluoromethyl; or NR_1R_2 wherein R_2 is hydrogen or alkyl of from one to six carbon atoms and R_1 is alkyl of from one to six carbon atoms, or alkyl of from two to six carbon atoms substituted by amino, alkylamino, or dialkylamino in which alkyl contains one to six carbon atoms; or 2,6-dimethylphenyl.

12. A pharmaceutical composition comprising an electroconvulsive shock-induced amnesia reversing effective amount of a compound having the structural formula



wherein R is hydroxyl, O— as a salt with a pharmaceutically acceptable metal or amine cation;



wherein X is hydrogen, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halo, or trifluoromethyl; O-alkyl having from one to six carbon atoms; or NR_1R_2 wherein R_1 is hydrogen, alkyl of from one to six carbon

atoms, or alkyl of from two to six carbon atoms substituted by amino, alkylamino, or dialkylamino in which alkyl contains one to six carbon atoms, hydroxy, or alkoxy of from two to six carbon atoms, mercapto, or alkylmercapto of from two to six carbon atoms; 5- or 6-membered cycloalkyl substituted by alkyl of from one to four carbon atoms; phenyl or phenyl substituted by alkyl of from one to four carbon atoms; and R_2 is hydrogen or alkyl of from one to six carbon atoms in combination with a pharmaceutically acceptable carrier.

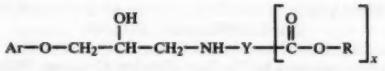
13. A method for reversing amnesia caused by electroconvulsive shock in a mammal in need of said treatment, which method comprises administering to said mammal the pharmaceutical composition defined in claim 12.

4,559,359
METHOD FOR TREATING GLAUCOMA BY THE TOPICAL ADMINISTRATION OF SELECTIVELY METABOLIZED BETA-BLOCKING AGENTS

William L. Matier, Libertyville, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 276,465, Jun. 23, 1981, Pat. No. 4,455,317. This application May 29, 1984, Ser. No. 615,024
Int. Cl.[4] A61K *31/275, 31/235, 37/44*
U.S. Cl. 514—522 21 Claims

1. A method for treating glaucoma or for lowering intraocular pressure in a mammal, which comprises topically applying to the eye of such mammal an intraocular pressure-lowering effective amount of a compound represented by the formula:



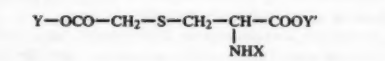
wherein Y is a straight or branched carbon chain of from 1 to about 10 carbon atoms or aralkyl of from 8 to about 20 carbon atoms; R is lower alkyl, lower alkenyl, lower alkynyl, phenyl, naphthyl, phenylalkyl or naphthylalkyl; x is an integer from 1 to about 3, provided that when X is greater than 1, different occurrences of the —COOR group may be the same or different; Ar is phenyl or naphthyl optionally substituted with acetamido, amino, nitro, lower alkylamino, hydroxy, lower hydroxyalkyl, acetyl or cyano with the proviso that when Ar is unsubstituted phenyl or naphthyl, R cannot be lower alkyl, lower alkenyl or lower alkynyl, or a pharmaceutically acceptable salt thereof.

4,559,360
CYSTEINE DERIVATIVES, A PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Laura Puricelli, Brescia, Italy, assignor to Magis Farmaceutici S.R.L., Brescia, Italy

Filed Nov. 21, 1984, Ser. No. 673,619
Claims priority, application Italy, Nov. 23, 1984, 23844 A/83
Int. Cl.[4] A61K *31/165, 31/245;* C07C *103/50, 69/157*
U.S. Cl. 514—548 8 Claims

1. S-(carboxymethyl)-L-cysteine compound of the formula:



(I)

wherein Y, Y' and X are the same or different, and are either H or acetylsalicylic and at least one of Y, Y' and X is acetylsalicylic.

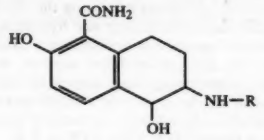
8. A pharmaceutical composition comprising: a mucolytically, an anti-inflammatorally, or an analgesically effective amount of the compound of formula (I) as defined in claim 1, or pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier.

4,559,361
NAPHTHALENECARBOXAMIDES, THEIR PRODUCTION AND USE

Yoshikazu Oka, Kawanishi, Japan, assignor to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 5, 1983, Ser. No. 538,805
Claims priority, application Japan, Oct. 15, 1982, 57-181948
Int. Cl.[4] C07C *103/28;* A61K *31/165*
U.S. Cl. 514—620 3 Claims

1. A method of depressing intraocular pressure in a mammal, which comprises administering to the mammal an effective amount of a compound of the formula:



wherein R is phenyl-C_{1-6} alkyl, or a physiologically acceptable salt thereof.

4,559,362
IMMUNOPOTENTIATOR

Hamao Umezawa; Tomio Takeuchi, and Masaaki Ishizuka, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,184
Claims priority, application Japan, Nov. 27, 1982, 57-208254
Int. Cl.[4] A61K *31/13*
U.S. Cl. 514—674 3 Claims

1. An immunopotenciating method which comprises administering spermidine or its pharmacologically acceptable salt in an effective amount to a warm-blood animal having an immunity-associated disease.

4,559,363
PROCESS FOR REACTING CARBON MONOXIDE AND WATER

Jeffrey T. Miller, Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 17, 1984, Ser. No. 641,829
Int. Cl.[4] C07C *1/02, 1/10*
U.S. Cl. 518—711 18 Claims

1. A method for the production of hydrocarbons by reacting carbon monoxide and water at a temperature in the range of from about 300° C. to about 480° C., at a pressure in the range of from about 5 to about 150 kilograms per square centimeter, and in the presence of a catalyst composition consisting essentially of a cadmium component and a support material having acidic properties, wherein the cadmium component is in the form of the elemental metal, its oxide or salt or a combination thereof, and wherein the cadmium component is present at a concentration level in the range of from about 0.1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst.

4,559,364

CATALYSTS HAVING ALKOXIDE-MODIFIED SUPPORTS

Clayton D. Wood, Framingham; Philip E. Garrou, Holliston; Iwao Kohatsu, Lexington, all of Mass., and Edward F. Gleason, Berkeley, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 567,112, Dec. 30, 1983, abandoned. This application Sep. 28, 1984, Ser. No. 655,991
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—715 19 Claims

1. In a process for producing hydrocarbons by contacting carbon monoxide and hydrogen at reactive conditions, the improvement which comprises increasing the yield of methane by contacting the carbon monoxide and hydrogen in the presence of a catalyst composition comprising a catalytic Group VIII metal on an alkoxide-modified support, the alkoxide-modified support comprising a core support material having on its outer surface a thin layer of a metal oxide produced from a precursor metal alkoxide, wherein the metal of the metal alkoxide is a metal of Group IIIA, IVA, IVB or VB.

4,559,365

IRON CARBIDE ON TITANIA SURFACE MODIFIED WITH GROUP VA OXIDES AS FISHER-TROPSCH CATALYSTS

Israel E. Wachs, Bridgewater; Rocco A. Fiato, Scotch Plains, and Claudio C. Chersich, Englewood Cliffs, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1984, Ser. No. 626,068
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—717 11 Claims

1. A process for producing hydrocarbons, including alkane hydrocarbons, from gaseous feed mixtures of CO and H_2 comprising contacting said feed, at a temperature ranging from about 200° to 350° C. and for a time sufficient to convert at least a portion of said feed to alkane hydrocarbons, with a catalyst comprising iron carbide supported on a surface modified titania support wherein said support comprises an oxide of a metal selected from the group consisting of niobium, vanadium, tantalum and mixture thereof supported on titania wherein at least a portion of said supported oxide is in a non-crystalline form.

4,559,366

PREPARATION OF MICROCELLULAR POLYURETHANE ELASTOMERS

Fritz Hostettler, Freehold, N.J., assignor to Jaquelyn P. Pirri, White Plains, N.Y., a part interest

Filed Mar. 29, 1984, Ser. No. 594,574
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—51 41 Claims

1. An integral skin microcellular polyether polyurethane elastomer product having a specific gravity in the range approximating about 0.4 to about 0.7 gm/cm^3 produced by reacting a formulation comprising:

(a) liquid quasi-polyoxyethyleneoxypropylene prepolymers having a crystalline point below about 13° C. resulting from the reaction of (1) a mixture consisting essentially of (i) a normally-solid diphenylmethane diisocyanate and (ii) the carbodiimide of diphenylmethane diisocyanate and/or the uretone imine of diphenylmethane diisocyanate, or (iii) the carbodiimide of tolylene diisocyanate and/or the uretone imine of tolylene diisocyanate; with (2) an ethylene oxide capped polyol of the group consisting of poly(oxyethyleneoxypropylene)polyols and polymer/poly(oxyethyleneoxypropylene)polyols and mixtures thereof, said ethylene oxide capped polyol having a hydroxyl equivalent weight of about 750 to about 3000, a hydroxyl functionality of 2 to 3, an oxyethylene cap of about 10 to about 30% by weight, and an internal oxyethylene content of from about 0 to 40% by weight, the total oxyethylene content of said capped polyol not exceeding about 50% by weight, the remainder of the capped polyol consisting essentially of oxypropylene;

(b) an ethylene oxide capped polyol of the group consisting of poly(oxyethyleneoxypropylene)polyols and polymer/poly(oxyethyleneoxypropylene)polyols and mixtures thereof, said ethylene oxide capped polyol having the characteristics set forth in (a) above;

(c) a difunctional chain extender characterized by hydroxyl and/or amino groups containing amino hydrogen;

(d) said reaction taking place in the presence of a halogenated hydrocarbon blowing agent;

(e) said reaction being effected at an NCO index number in the range of from 94 to 105; and

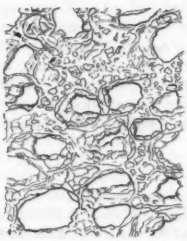
(f) in the presence of polymer particles stably dispersed in said quasi-prepolymer (a) above and/or capped polyol (b) above, the total polymer content not exceeding about 25% by weight, based on the total weight of the formulation.

4,559,367

COMBINATION BLOWING AGENT AND FILLER FOR THERMOPLASTIC FOAMS

Richard L. Hurps, Newark, and Kyung W. Suh, Granville, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 12, 1985, Ser. No. 722,485
Int. Cl.[4] C08J *9/12, 9/14*
U.S. Cl. 521—79 17 Claims



1. A process for the preparation of an alkenyl aromatic polymeric foam body, the steps of the method comprising:

(1) heat plastifying an alkenyl aromatic polymeric material;

(2) adding to the heat plastified polymeric material, under a pressure sufficient to prevent foaming, a volatile organic fluid foaming agent and an amount of finely-divided, water-containing organic vegetable matter, to provide a foaming agent/polymeric material, mixture;

(3) mixing the volatile organic fluid foaming agent and the finely-divided, water-containing organic vegetable matter with the heat plastified polymeric material to form a blowable mixture;

(4) reducing the temperature of the blowable mixture to a temperature such that when the pressure is reduced thereon, an alkenyl aromatic polymeric foam of desirable quality is formed; and

(5) extruding the blowable mixture into a zone of lower pressure to thereby cause the blowable mixture to form a foam of desirable quality.

4,559,368

FIRE-GUARD COMPOSITION AND METHOD FOR PREPARING SAME

Hans-Dieter J. Heinen, Malmedy, Belgium, assignor to Intellectual Trade Cy S.A., Charlotte, Luxembourg

Continuation of Ser. No. 873,809, Jan. 31, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 107,974

Claims priority, application Luxembourg, Jan. 31, 1977, 76670

Int. Cl.[4] C08J 9/00

U.S. Cl. 521—91 18 Claims

1. A flame resistant composition which may be applied to form a coating or a lining comprising kaolin a ceramic fiber dispersed in an air-hardenable organic binder, said binder being insoluble in water after hardening and said fiber being randomly distributed throughout the binder in an amount between about 20 and 45 weight percent based on the total weight of the composition after hardening.

4,559,369

SILICONE FOAM, WATER-BASED, AEROSOL COMPOSITION

Therese M. Bauman; Chi-long Lee, and James A. Rabe, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 665,223

Int. Cl.[4] C08J 9/28, 9/30

U.S. Cl. 521—98 16 Claims

1. A composition, under superatmospheric pressure, consisting of a mixture of

(A) 100 parts by weight of silicone emulsion which is an aqueous, oil-in-water emulsion that cures upon drying at ambient temperature to an elastomeric film, the emulsion comprising crosslinked silicone polymer, surfactant, water, and optionally filler, curing agent, thickener, or mixtures thereof, the emulsion having a solids content of from 35 to 80 percent by weight,

(B) from 0 to 2 parts by weight of lauryl alcohol,

(C) from 0 to 10 parts by weight of fibers having a diameter of from 1 to 10 micrometers and a length of from 30 micrometers to 10 millimeters with a length to diameter ratio of greater than 10 to 1, and

(D) sufficient aerosol propellant selected from the group consisting of nitrogen, nitrous oxide, isobutane, propane, dichlorodifluoromethane trichlorofluoromethane, and mixtures thereof, to convert said composition to a froth when released to atmospheric pressure at 25° C., the froth producing an open-cell, elastomeric foam upon removal of water.

4,559,370

COPOLYESTER POLYOL RESINS, POLYOL BLENDS COMPRISING THE SAME, AND RESULTANT POLYISOCYANURATE FOAMS

Robert H. Blanpied, 10122 Cherry Tree Dr., Dallas, Tex. 75243

Filed May 25, 1984, Ser. No. 614,041

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—112 16 Claims

1. A hydroxyl terminated copolyester polyol resin having a functionality of about 2, comprising the reaction product of:

A. an aromatic component selected from phthalic anhydride; phthalic acid isomers; phthalic acid halide isomers; di-lower alkanol esters of phthalic acid isomers; digestion products of polyethylene terephthalate; or mixtures thereof;

B. at least one aliphatic component selected from succinic anhydride; succinic, glutaric, or adipic acids; di-lower alkanol esters of succinic, glutaric, or adipic acids; acid halides of succinic, glutaric, or adipic acids; or mixtures thereof; and

C. at least one primary hydroxyl glycol; and

D. at least one secondary hydroxyl glycol; the mole ratios of the components being:

(1) glycols to aromatic plus aliphatic component of from about 1.3 to 2:1;

(2) aromatic component to aliphatic component of from about 0.6 to 4.0:1;

(3) a secondary to primary hydroxyl glycol of from 0.05 to 0.4:1, where all mole ratios represent the final mole ratios inasmuch as glycols may be removed during processing; and

(4) ethylene glycol content to aromatic component of from about 0.01 to 0.5:1.0 when a digestion product of polyethylene terephthalate is used as the aromatic component.

4,559,371

PHOTOCURABLE COLORED COMPOSITIONS EMPLOYING ALPHA-AMINO PHENONE INITIATOR

Rinaldo Hüsler, Basel; Rudolf Kirchmayr, Aesch, and Werner Rutsch, Fribourg, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,622

Claims priority, application Switzerland, Feb. 18, 1983, 903/83

Int. Cl.[4] C08F 2/50

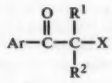
U.S. Cl. 204—158 R 9 Claims

1. A photocurable coloured composition containing:

(a) an olefinically unsaturated, photopolymerisable binder,

(b) a pigment or a dye and

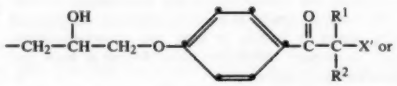
(c) as photoinitiator, at least one compound of the formula I

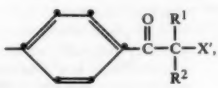


(I)

wherein

Ar is a phenyl radical substituted in the 4-position by a group $-OR^9$, R^9 is C_1–C_8-alkyl, C_3–C_6-alkenyl, cyclohexyl, benzyl, phenyl, tolyl or one of the groups: $-CH_2CH_2OH$, $-CH_2CH_2-OOC-CH=CH_2$, $-CH_2-COO(C_1-C_4\text{-alkyl})$, $-CH_2CH_2-COO(C_1-C_4\text{-alkyl})$,





R^1 and R^2 are C_1–C_4-alkyl, or R^1 and R^2 together are C_4–C_5-alkylene, and

X and X′ are a morpholino radical or a radical of the formula $-N(CH_2CH_2-OCH_3)_2$,

or an acid addition salt thereof.

4,559,372

FIREPROOFED POLYAMIDE COMPOSITIONS

Bruno Giroud-Abel, Ecully, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Filed Oct. 22, 1984, Ser. No. 663,483
Claims priority, application France, Oct. 21, 1983, 83 17022
Int. Cl.[4] C08K 3/02, 3/16, 3/22, 3/24, 3/26, 3/32, 3/34, 5/09, 5/15, 5/34, 5/36, 5/45, 9/10
U.S. Cl. 523—205 17 Claims

1. A composition of matter comprising (i) a polyamide, (ii) a fireproofing amount of red phosphorus, and (iii) an effective amount of at least one lanthanide compound.

4,559,373

WELDABLE SEALANTS FOR METAL AND METHOD OF USE

James L. Guthrie, Ashton; Helen F. Roberts, Sudlersville, and Christian B. Landsager, Ashton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,667
Int. Cl.[4] C08K 3/08; C08L 61/00
U.S. Cl. 523—220 8 Claims

1. A weldable sealant composition suitable for use as a sealant for the purpose of filling space between two pieces of steel to be welded comprising an admixture of

a malleable sealant having a visosity of from between 6 million to 50 million centipoises at 25° C., said sealant being present in an amount of 60–99% by weight of said admixture, and

a weldably effective amount of ferrous metal particles dispersed in said sealant, said particles being present in an amount of from about 1 to 40% by weight and having a particle size smaller than 100 mesh,

said sealant composition being capable upon being heated to a temperature of at least 80° C. of softening to form a bead which adheres to the steel surface to be sealed and said adhered sealant composition upon returning to ambient conditions being capable of flowing when squeezed by a stationary welding machine to allow said steel pieces to approach each other sufficiently to be welded.

4,559,374

CONTINUOUS EMULSION POLYMERIZATION PROCESS FOR PREPARATION OF FLAME-RETARDANT LATEX

Michael L. Senyek, Tallmadge, and Mitchell S. Kolaczewski, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 19, 1984, Ser. No. 652,042
Int. Cl.[4] C08F 2/22, 2/24
U.S. Cl. 523—348 13 Claims

1. An improved continuous aqueous emulsion polymerization process for the preparation of flame retardant latex comprising the steps of:

(a) continuously adding to a first reaction vessel a mixture of reagents consisting essentially of: at least one emulsifying agent, at least one monoethylenically unsaturated carboxylic acid, ester or amide, at least one aliphatic conjugated diolefin, water, a buffer, at least one monovinylidene aromatic monomer, vinylidene chloride and at least one polymerization initiator;

(b) allowing said mixture of reagents to remain in said first reaction vessel for 3 to 6 hours for partial polymerization to take place to a conversion of 70% to 85% to form a partially polymerized latex, wherein the partially polymerized latex is withdrawn from the first reaction vessel continuously at a rate equal to the total rate of addition of the mixture of reagents to the first reaction vessel and wherein the partially polymerized latex is fed into a second reaction vessel;

(c) continuously adding to the second reaction vessel additional reagents consisting essentially of conjugated diolefins, monovinylidene aromatic monomers, polymerization initiator, buffer, and emulsifying agents to form a partially polymerized latex/monomer mixture wherein the total monomers charged into the first and second reactors are comprised of from about 15 to about 45 weight percent of vinylidene chloride, from about 0.2 to about 5 weight percent of monoethylenically unsaturated carboxylic acids, esters or amides, from about 20 to about 75 weight percent of aliphatic conjugated diolefins, and from about 55 to about 5 weight percent of monovinylidene aromatic monomers, wherein from 50% to 95% by weight of the total monomers charged into the first and second reaction vessels are charged into the first reactor, wherein said partially polymerized latex/monomer mixture is allowed to remain in the second reactor for 3 to 6 hours for a substantial degree of polymerization to take place to form a substantially polymerized latex having a conversion of 85% to 95% and wherein the substantially polymerized latex made in the second reactor is withdrawn continuously at a rate equal to the total rate of addition of the partially polymerized latex and additional reagents to the second reaction vessel and fed into a third reaction vessel;

(d) allowing the substantially polymerized latex to remain in the third reaction vessel for 3 to 6 hours until essentially complete conversion of at least 90% takes place.

4,559,375

LOW STYRENE EMISSION VINYL ESTER RESIN FOR FIBER-REINFORCED APPLICATIONS

John A. Schols, and Keechung Yu, both of Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 14, 1985, Ser. No. 691,604
Int. Cl.[4] C08L 63/00, 63/10
U.S. Cl. 523—449 7 Claims

1. An improved, low styrene emission, VER composition containing: (1) a VER which is an esterification product of a polyepoxide and a monounsaturated monocarboxylic acid; (2) styrene as a reactive diluent; (3) paraffin as a styrene emission inhibitor; and (4) wherein the improvement comprises including in such composition lanolin wherein said lanolin is present in an amount sufficient to increase the adhesion characteristic of the VER composition with a reinforcing material used therewith.

4,559,376

METHOD OF PRODUCING PLASTIC COMPOSITES FILLED WITH CELLULOSE OR LIGNOCELLULOSIC MATERIALS

Josef Kubat, Solparksvägen 3, S-171 35 Solna, and Tore C. F. Klason, P.1.2201, S-441 90 Alingsås, both of Sweden

PCT No. PCT/SE82/00422, § 371 Date Aug. 8, 1983, § 102(e) Date Aug. 8, 1983, PCT Pub. No. WO83/02118, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 10, 1982, Ser. No. 525,041
Claims priority, application Sweden, Dec. 11, 1981, 8107444
Int. Cl.[4] C08L 1/02; C08J 3/20, 5/10
U.S. Cl. 524—13 7 Claims

1. A method of producing plastics composites containing cellulose or lignocellulose material in a plastics matrix, said method comprising the successive steps of:

(1) subjecting the cellulose or lignocellulose material to pre-hydrolytic chemical degradation, and thereafter

(2) incorporating the thus degraded cellulosic or lignocellulosic material into the plastics matrix thereby facilitating comminution and improved dispersion of the cellulosic or lignocellulosic materials in the plastic phase.

4,559,377

CEILING BOARD EDGE COATING

James R. Gleason; Roy E. Shaffer, both of Newark, Ohio, and Issac A. Awabdy, Meridian, Miss., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 27, 1984, Ser. No. 604,676
Int. Cl.[4] C08L *1/28*
U.S. Cl. 524—44 9 Claims

1. A composition comprising hydroxyethyl cellulose, an acrylic latex, a polypropylene and at least one particulate filler selected from the group consisting of clay, calcium carbonate, mica, titanium dioxide and calcium aluminum silicate.

4,559,378

STABILIZATION OF ELASTOMERS WITH ALIPHATIC-PHENYL DIAMINES AND ALIPHATIC PHOSPHITE COMPOUNDS

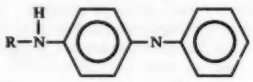
Edward L. Kay, Akron; Richard Gutierrez, Canal Fulton, and Wendall R. Conard, Kent, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 30, 1984, Ser. No. 645,739
Int. Cl.[4] C08K *5/52*
U.S. Cl. 524—147 12 Claims

1. A stabilized guayule rubber, comprising:

approximately 100 parts by weight of the elastomer; and

from about 0.05 to about 1.0 parts by weight of a compound having the formula:



wherein R is an alkyl having from 1 to 12 carbon atoms, a cycloalkyl or an alkyl substituted cycloalkyl having from 5 to 12 carbon atoms, and combinations thereof; and

from about 0.05 to about 1.0 parts by weight of a phosphite having the formula

$$(R'—O)_3P$$

where R' is an alkyl having from 1 to 12 carbon atoms, a cycloalkyl or an alkyl substituted cycloalkyl having from 5 to 12 carbon atoms, and combinations thereof.

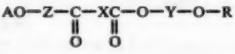
4,559,379

4-HYDROXYPHENYLTHIO SUBSTITUTED STABILIZERS FOR POLYMERS

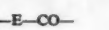
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 531,876, Sep. 14, 1983, abandoned. This application Feb. 5, 1985, Ser. No. 698,278
Int. Cl.[4] C08K *5/36*; C07C *149/40*
U.S. Cl. 524—289 6 Claims

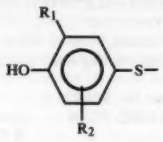
1. A compound of the formula



wherein A is alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms or a group of the formula



wherein Q is a group of the formula



and

E is alkylene of 2 to 6 carbon atoms;

R_1 and R_2 are independently hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms;

X which can be the same or different in each repeating unit is alkylene of 2 to 10 carbon atoms which is unsubstituted or substituted by a group Q or is arylene of 6 to 10 carbon atoms;

Y which can be the same or different in each repeating unit is alkylene of 2 to 6 carbon atoms, which is uninterrupted or interrupted by one or two oxygen atoms and is unsubstituted or substituted by a group —O—A;

Z is a direct bond or is alkyleneoxy of 2 to 6 carbon atoms, whereby the oxygen atom is attached to the carbonyl group and the alkylene moiety is uninterrupted or interrupted by one or two oxygen atoms;

R is hydrogen or A;

with the proviso that at least one of A, X or Y contains a group Q.

2. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,559,380

POLYACETAL RESIN COMPOSITION

Takuzo Kasuga, Tokyo; Yukio Ikenaga, Fuji; Masami Yamawaki, Fuji, and Keizo Tanimura, Fuji, all of Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Continuation of Ser. No. 547,813, Nov. 1, 1983, abandoned. This application Apr. 8, 1985, Ser. No. 720,063
Claims priority, application Japan, Nov. 25, 1982, 57-206408
Int. Cl.[4] C08K *5/09*
U.S. Cl. 524—317 7 Claims

1. A polyacetal composition which comprises polyacetal, an aliphatic ester of a polyhydric alcohol having a hydroxy group, polyethylene glycol, and an organometallic salt, wherein the organometallic salt is present in an amount of from 0.01 to 5 percent by weight based on the total composition.

4,559,381

POLYMERIC COVERING MATERIALS FOR GROWING PLANTS OR CROPS

Graciano J. Tapia, and Oscar G. Martinez, both of Madrid, Spain, assignors to Alcudia, Empresa Para la Indusrria Quimica, S.A., Spain

Filed Jan. 13, 1984, Ser. No. 570,504
Int. Cl.[4] C08K *3/24, 3/18*
U.S. Cl. 524—405 11 Claims

1. A polymeric composition for covering plants comprising at least 80 wt % of a polyolefin and from about 0.5 wt % to about 15 wt % of an additive containing the bond boron-oxygen wherein said additive containing the bond boron-oxygen is boric acid.

4,559,382

PROCESSABLE RADIATION CURABLE POLY(VINYL CHLORIDE) RESIN COMPOSITIONS

John A. Martens, and Brian H. Williams, both of White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1983, Ser. No. 501,270
Int. Cl.[4] C08J 3/28; C08L 27/06
U.S. Cl. 524—535 8 Claims

1. A composition comprising a poly(vinyl chloride) resin and a vinyl chloride resin-compatible compound having (a) two to six terminal or pendant ethylenically-unsaturated groups, (b) two or more groups selected from divalent carbonylamino groups, divalent thiocarbonylamino groups, or both, and (c) polyvalent aliphatic group, Z, where Z represents the polyvalent residue remaining after the removal of hydroxyl or amino groups from an oligomeric nucleophilic compound, $Z(XH)_n$, Z containing carbon and hydrogen atoms, and optionally oxygen atoms, and having a molecular weight of 500 to 5000, where X represents —O— or

in which R^2 is hydrogen or lower alkyl group, and where n represents an integer having a value of 2 to 6, provided that there is at least one divalent carbonylamino or thiocarbonylamino group per ethylenically-unsaturated group, the amount of said vinyl chloride resin-compatible compound being sufficient so that upon exposure of the composition to actinic radiation, a gel is formed, said vinyl chloride resin-compatible compound being characterized such that a film of a poly(vinyl chloride) resin and about 10 percent by weight of said vinyl chloride resin-compatible compound remains transparent when pressed at elevated temperatures near the fusing point of the composition of poly(vinyl chloride) resin and said vinyl chloride resin-compatible compound.

8. A film prepared from the composition of claim 1.

4,559,383

CHAIN-EXTENDABLE CROSSLINKABLE URETHANE MODIFIED POLYHYDROXY OLIGOMERS AND COATING COMPOSITION COMPRISING SAME

Joseph W. Holubka, Livonia, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 334,798, Dec. 28, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,844
Int. Cl.[4] C08L 75/04, 61/28
U.S. Cl. 524—542 17 Claims

1. A solvent-based thermosetting resin composition comprising:

a crosslinkable urethane modified polyhydroxy oligomer which is chain-extendable at between about 100° C. and about 190° C., said oligomer having a molecular weight between about 200 and about 1500 and bearing three or more hydroxyl groups and one blocked isocyanate group, said isocyanate group being blocked with a monofunctional blocking agent which de-blocks at between about 100° C. and about 190° C.; and

crosslinking agent reactive with the hydroxyl functionality of said oligomer and substantially unreactive with isocyanate functionality.

4,559,384

PROCESS FOR PREVENTING AGGLOMERATION OF POWDERS BY USING TRIETHYLENEDIAMINE POLYMERS

Akihiko Nomura, and Masahiko Fujii, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Dec. 19, 1984, Ser. No. 683,484
Claims priority, application Japan, Dec. 20, 1983, 58-238964; Feb. 17, 1984, 59-27254
Int. Cl.[4] C08J 3/12
U.S. Cl. 524—612 9 Claims

1. A process for preventing agglomeration of a powders which comprises employing triethylenediamine polymer as an agglomeration preventing agent.

4,559,385

METHOD FOR PREPARING AQUEOUS EMULSIONS

Karl Huhn, and Kurt Ullrich, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,416
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343575
Int. Cl.[4] C08L 83/00
U.S. Cl. 524—838 3 Claims

1. An aqueous emulsion for impregnating organic fibers comprising in addition to water and a dispersant: (1) a diorganopolysiloxane having a Si-bonded hydroxyl group in each terminal unit, in which the organic radicals of the diorganopolysiloxane are free of basic nitrogen atoms; (2) an organopolysiloxane containing diorganosiloxane units in which the organic radicals of the diorganosiloxane are monovalent hydrocarbon radicals, and at least two monovalent SiC-bonded organic radicals per molecule having a basic nitrogen atom, in which the organopolysiloxane (2) is present in the emulsion in an amount of from 5 to 50 weight percent based on the weight of diorganopolysiloxane (1); (3) an organosilicon compound selected from the group consisting of an organosilane containing at least two SiOC-bonded monovalent organic radicals containing carbon and hydrogen or carbon, hydrogen and oxygen, partial hydrolyzates of such organosilane and mixtures thereof, in which the organosilicon compound (3) is present in the emulsion in an amount of from 2 to 6 weight percent based on the total weight of the diorganopolysiloxane (1) and organopolysiloxane (2); and (4) a condensation catalyst, which is present in the emulsion in an amount of from 0.2 to 1 weight percent based on the toatal weight of the diorganopolysiloxane (1) and organosiloxane (2), in which the emulsion is prepared by mixing the organosilicon compound (3) with an aqueous emulsion containing diorganopolysiloxane (1) and organopolysiloxane (2) and thereafter mixing the resultant emulsion with the condensation catalyst.

4,559,386

ABS COMPOSITIONS AND PROCESS FOR PREPARING SAME

Wan C. Wu, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 553,717, Nov. 21, 1983, Pat. No. 4,510,287. This application Jul. 6, 1984, Ser. No. 628,367
Int. Cl.[4] C08L 55/02
U.S. Cl. 525—71 19 Claims

1. A composition comprising a blend of separately prepared polymeric compositions (A) and (B),

(A) being a first rubber graft copolymer formed by graft polymerizing (a) monoalkenyl aromatic monomer and ethylenically unsaturated nitrile monomer on (b) a preformed graftable rubber containing a rubber-forming monomer component to surface graft at least a portion of the polymerizing monomers onto said rubber and provide a first graft copolymer while simultaneously forming a

first ungrafted copolymer of said monomers in which said first graft copolymer is dispersed, the level of surface-grafted unsaturated nitrile monomer in the first graft copolymer being different by at least 2.0 weight percent from that in said first ungrafted copolymer; and

(B) being a second rubber graft copolymer of said monomers on a preformed graftable rubber substrate dispersed in a simultaneously formed second ungrafted copolymer of said monomers, the level of surface-grafted ethylenically unsaturated nitrile monomer in said second rubber graft copolymer being essentially matched with that in said second ungrafted copolymer.

4,559,387

PRIMER COMPOSITION

Isao Endo, and Joji Kuniya, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,106
Claims priority, application Japan, Oct. 14, 1983, 58-191976
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—102 **15 Claims**

1. A primer composition comprising

(A) 100 parts by weight of a silane-modified resin obtained by reacting a resin formed by introducing an epoxy group and a hydroxyl group, which may be partially esterified, into a polymer comprising 1,3-pentadiene as a main monomer and having an iodine value of 200 to 500 and an average molecular weight of 350 to 10,000 with a silane having an epoxy, amino, or mercapto group,

(B) 40 to 600 parts by weight of a mercapto group-containing silane represented by the general formula:

$$HS(CH_2)_aSi{-}OR^1)_3$$

wherein a is an integer equal to 2 or 3, and R^1 is an alkyl group having 1 to 4 carbon atoms,

(C) 10 to 400 parts by weight of an amino group-containing silane represented by the general formula

$$X(CH_2)_b{-}\underset{\displaystyle (CH_3)_c}{\overset{\displaystyle |}{Si}}{-}(OR^2)_{3-c}$$

where X stands for a substituted or unsubstituted amino group selected from the group consisting of:
$-N(R^3)_2$,
$-NH(CH_2)_2N(R^3)_2$ and
$-NH(CH_2)_2NH(CH_2)_2N(R^3)_2$,
b is an integer equal to 3 or 4, c is an integer equal to 0 or 1, R^2 is an alkyl group having 1 to 4 carbon atoms, and R^3 is a hydrogen atom or an alkyl group having 1 or 2 carbon atoms,

(D) 5 to 200 parts by weight of a silicon compound represented by the following formula or a partially hydrolyzed condensate thereof:

$$(R^4)_dSi(OR^5)_{4-d}$$

wherein R^4 is a monovalent hydrocarbon group having 1 to 6 carbon atoms, R^5 is an alkyl group having 1 to 4 carbon atoms or an alkoxyalkyl group having a total carbon number of 3 to 6, and d is an integer equal to 0 or 1, and

(E) 300 to 3,000 parts by weight of an organic solvent.

4,559,388

COPOLYESTER-CARBONATE COMPOSITION

Ping Y. Liu, Naperville, Ill., and Edward L. Belfoure, New Harmony, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 19, 1984, Ser. No. 683,660
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—146 **32 Claims**

1. A copolyester-carbonate composition exhibiting improved resistance to mild organic solvents comprising, in admixture:

(i) at least one high molecular weight thermoplastic aromatic copolyester-carbonate resin containing from about 25 to about 90 mole percent ester bonds;

(ii) at least one high molecular weight thermoplastic aromatic polycarbonate resin;

(iii) at least one amorphous polyester resin containing the reaction products of

(a) at least one polyol selected from 1,4-cyclohexanedimethanol or a mixture of 1,4-cyclohexanedimethanol and ethylene glycol, and

(b) at least one aromatic dicarboxylic acid or its ester forming reactive derivative selected from isophthalic acid, terephthalic acid, or mixtures thereof; and

(iv) at least one polymer selected from

(a) an olefin acrylate copolymer,

(b) a polyolefin, and

(c) an olefin diene terpolymer; components (ii)–(iv) being present in amounts at least sufficient to impart to said composition a resistance to mild organic solvents greater than that possessed by said copolyester-carbonate resin.

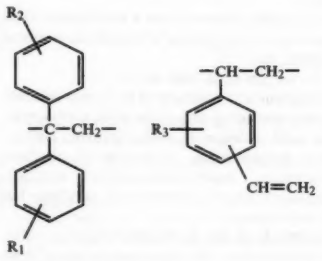
4,559,389

GRAFT COPOLYMERS, PROCESS FOR THE PREPARATION THEREOF AND IONIZING RADIATION SENSITIVE RESIST USING SUCH COPOLYMERS

Koichi Hatada, Ikeda; Yoshio Okamoto, Amagasaki, and Tatsuki Kitayama, Higashiosaka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

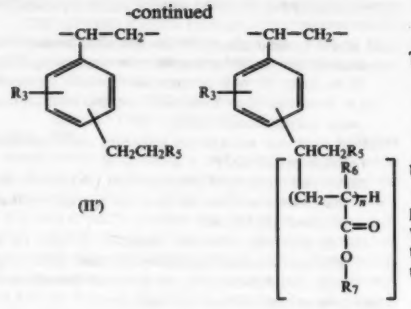
Division of Ser. No. 546,337, Oct. 28, 1983, Pat. No. 4,523,000.
This application Jan. 10, 1985, Ser. No. 690,352
Claims priority, application Japan, Nov. 2, 1982, 57-193068; Dec. 1, 1982, 57-210830
Int. Cl.[4] C08L *257/00, 257/02*
U.S. Cl. 525—250 **37 Claims**

1. A solvent-soluble graft copolymer having a number average molecular weight of about 1,500 to about 2,000,000 and comprising recurring units represented by the following formulae (I), (II) and/or (II'), and (IV), said recurring units being combined to form the main alkylene chain, in which the amount of the formula (I) unit is about 5 to about 60 mol % of the total amount of the units of the formulae (I), (II) and/or (II'), and (IV), and the amount of the grafted side chains in the brackets of the formula (IV) is at least about 10% by weight of the amount of the main chain of the graft copolymer exclusive of said side chains:



(I) (II)

-continued



(II)

(IV)

wherein R_1, R_2 and R_3 represents independently hydrogen, a straight or branched chain alkyl group having 1 to 4 carbon atoms or halogen; R_5 is a straight or branched chain alkyl group having 1 to 6 carbon atoms, a phenyl group or a benzyl group; R_6 is hydrogen or a methyl group; R_7 is a straight or branched chain alkyl group having 1 to 10 carbon atoms, an aryl group, an aralkyl group or an aminoalkyl group; and n is an integer of 1 to 50.

4,559,390

METHOD FOR PREVENTING DEGRADATION AND DETERIORATION OF VULCANIZED RUBBER MATERIAL

Noboru Watanabe, Yokohama; Motofumi Oyama, Yokosuka, and Yoichiro Kubo, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 495,821, May 18, 1983, abandoned. This application Jun. 7, 1984, Ser. No. 617,848

Claims priority, application Japan, May 18, 1982, 57-83745

Int. Cl.[4] C08F *19/20, 19/00*

U.S. Cl. 525—349 **6 Claims**

1. A method for preventing degradation and deterioration of vulcanized rubber materials forming a rubber article used in the operation of oil or gas wells and which come into contact with at least one substance selected from the group consisting of casing head gas, crude oil and natural gas, which substance contains therein corrosive gases including at least CO_2 and at least one of H_2S and SO_2, said method comprising using as the vulcanized rubber material forming said rubber article a sulfur-vulcanized copolymer rubber composition wherein the polymer chain of said copolymer rubber includes the following units:

(I) 10 to 60% by weight of a unit from an unsaturated nitrile selected from the group consisting of acrylonitrile and methacrylonitrile;

(II) up to 10% by weight of a unit from a conjugated diene selected from the group consisting of butadiene, isoprene and 1,3-pentadiene; and

(III) 30 to 90% by weight of at least one of

(i) a unit from ethylenically unsaturated monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, methylacrylate, 2-ethylhexylacrylate, octylacrylate, methoxyethyl acrylate, ethoxyethylacrylate, methoxyethoxyethyl acrylate, allyl glycidyl ether, vinyl chloroacetate, ethylene, butene-1, and isobutylene;

(ii) a unit resulting from the hydrogenation of a conjugated diene selected from the group consisting of butadiene, isoprene, and 1,3-pentadiene; and

(iii) mixtures of units (i) and (ii).

4,559,391

PROCESS FOR PRODUCING POLY(ALLYLAMINE) DERIVATIVES

Toshio Ueda; Tadashi Kato; Ryuichi Mukai, and Susumu Harada, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Nov. 13, 1984, Ser. No. 670,544

Claims priority, application Japan, Nov. 14, 1983, 58-213697

Int. Cl.[4] C08F *8/30*

U.S. Cl. 525—366 **3 Claims**

1. A process for producing a poly(allylurea), which comprises polymerizing an inorganic acid salt of monoallylamine with a radical-polymerization initiator having an azo group in the molecule, and allowing the resulting poly(allylamine salt) to react with a cyanic acid salt.

4,559,392

PROCESS FOR PRODUCING BROMOMETHYLATED POLYPHENYLENE ETHERS

Raban Grundmann, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,539

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334068

Int. Cl.[4] C08L *71/04;* **C08G** *65/48*

U.S. Cl. 525—390 **13 Claims**

1. A process for producing a bromomethylated polyphenylene ether, comprising the step of reacting a polyphenylene ether having the formula

wherein R_1 and R_2 are each independently methyl, ethyl, propyl or butyl; R_3 is H, methyl, ethyl, propyl or butyl; and n is 3–600, with formaldehyde and hydrogen bromide, in the presence of a carboxylic acid, at a temperature of 20°–150° C., and under conditions such that 0.02–1 bromomethyl group per phenylene group is introduced; and recovering resultant bromomethylated polyphenylene ether.

4,559,393

CROSSLINKABLE COMPOSITION COMPRISING AMINOEPOXY RESIN - III

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1983, Ser. No. 565,798

Int. Cl.[4] C08L *63/00*

U.S. Cl. 525—531 **29 Claims**

1. A substantially gel-free self-crosslinkable conjugated diene functional blocked dieneophile functional aminoepoxy resin of number average molecular weight about 1000–9000, comprising the reaction product of diepoxide with reactants comprising (a) amine functional diene chain extending reactant, and (b) amine functional blocked dieneophile chain extending reactant.

4,559,394

OLEFIN POLYMERIZATION USING ACTIVATED CHROMIUM CATALYST TREATED WITH TERTIARY ALCOHOL

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 500,752, Jun. 3, 1983, Pat. No. 4,489,172.
This application Jul. 27, 1984, Ser. No. 635,080
Int. Cl.[4] C08F *4/24, 10/00*
U.S. Cl. 526—106 **28 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a catalyst produced by a process comprising:

forming a silica-titania supported chromium catalyst precursor, the silica-titania containing 0.1 to 10 weight percent titanium, said chromium being present in an amount within the range of 0.1 to 5 weight percent;

activating said silica-titania supported chromium catalyst precursor in an oxygen-containing ambient at a temperature within the range of 500° to 900° C.;

contacting said thus activated silica-titania supported chromium catalyst precursor with a tertiary alcohol in an amount up to about 20 molecules per atom of chromium and

directly thereafter reactivating the resulting treated catalyst in an oxygen-containing ambient at a temperature within the range of 200° to 600° C.

4,559,395

FLAME RETARDENT EPOXY RESIN COMPOSITION

Roy J. Jackson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1985, Ser. No. 704,691
Int. Cl.[4] C08G *59/30, 59/50*
U.S. Cl. 528—102 **3 Claims**

1. An epoxy resin composition useful for preparing flame retardant laminates, said composition comprising:

(a) a brominated epoxy resin comprising the reaction product of tetrabromobisphenol-A and epichlorohydrin having an epoxide equivalent weight of about 350 to about 1500 and a bromine content of about 10 to about 50 percent by weight;

(b) an effective amount of an aromatic amine curing agent; and

(c) about 2.5 to about 10 parts by weight of dicyandiamide as a curing agent per 100 parts by weight of said brominated epoxy resin.

4,559,396

PEELLABLE FILM-FORMING ORGANOPOLYSILOXANE COMPOSITIONS

Shosaku Sasaki; Nobuo Kaiya, and Akihiko Shirahata, all of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 29, 1983, Ser. No. 489,883
Claims priority, application Japan, May 6, 1982, 57-75898
The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.
Int. Cl.[4] C08G *77/06;* C08L *83/04*
U.S. Cl. 528—15 **5 Claims**

1. A film-forming organopolysiloxane composition which is peelable from a tacky substance when cured, said composition being prepared by mixing components consisting essentially of

(1) 100 parts by weight of an essentially linear organopolysiloxane component having a viscosity of at least 100 centipoise at 25° C. and containing at least two silicon-bonded vinyl groups per molecule,

(2) 0.3 to 40 parts by weight of an organohydrogen polysiloxane component having at least 2 silicon-bonded hydrogen atoms per molecule, there being at least a total of 5 silicon-bonded vinyl groups per molecule of component (1) and silicon-bonded hydrogen atoms per molecule of component (2),

(3) 0.01 to 7 parts by weight of an unsaturated hydrocarbon compound component having the formula

$$HC{\equiv}CCR^1{=}CR^2R^3$$

wherein each R^1, R^2 and R^3 denotes, independently, a hydrogen atom, a monovalent hydrocarbon group or a divalent hydrocarbon group with the requirements that the total number of carbon atoms in the R^1, R^2 and R^3 groups has a value of from 2 to 6 and any R^1, R^2 and R^3 divalent hydrocarbon group being bonded to another R^1, R^2 or R^3 divalent hydrocarbon group by their second valences, and

(4) A catalytic amount of a component selected from the group consisting of platinum-containing catalysts, palladium catalysts and rhodium catalysts for the addition reaction of silicon-bonded vinyl or allyl groups with silicon-bonded hydrogen.

4,559,397

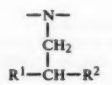
STORAGE STABLE OLIGOURETHANES WHICH ARE SELF CROSS-LINKING AT ELEVATED TEMPERATURE OR CAN BE CROSS-LINKED WITH ORGANIC POLYISOCYANATES, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS BINDERS OR BINDER COMPONENTS

Klaus Noll; Josef Pedain, both of Cologne, Fed. Rep. of Germany, and Terry Potter, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,709
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405937
Int. Cl.[4] C08G *18/80*
U.S. Cl. 528—45 **7 Claims**

1. An oligourethane which is stable in storage at room temperature and either self cross-linking at elevated temperature or capable of being cross-linked with organic polyisocyanates comprising

(a) about 0.1 to 3% by weight of tertiary amine nitrogen atoms in the form of structural units corresponding to the formula:



attached through urethane groups in end positions and/or within the molecule, wherein

R^1 represents hydrogen or an alkyl group having 1 to 4 carbon atoms,

R^2 represents $-C{\equiv}N$, $-CO-NH_2$, $-CO-NHR^3$, $-CO-NR^3_2$ or $-COOR^3$ and

R^3 represents a monovalent hydrocarbon group optionally having inert substituents,

(b) up to about 15% by weight of isocyanate groups, and

(c) up to about 15% by weight of masked isocyanate groups.

4,559,398
CURABLE EPOXY RESINS

Helmut Tesch, Birkenheide; Andreas Henne, Neustadt; Manfred Heym, Weisenheim, and Herbert Stutz, Karlsruhe, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,236

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327823

Int. Cl.⁴ C08G *59/68*

U.S. Cl. 528—94 **7 Claims**

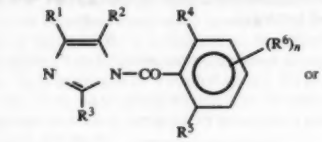
1. A curable resin composition containing

A. 100 parts by weight of an epoxy resin,

B. from 4 to 100 parts by weight of a conventional curing agent for epoxy resins, and

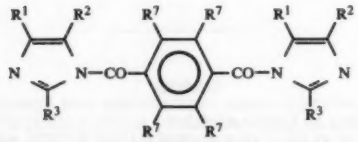
C. from 0.1 to 5 parts by weight of a N-acylimidazole as an accelerator,

wherein component C is an N-acylimidazole of the formula



I

or



II

where R^1, R^2 and R^3 can be identical or different and are each hydrogen, branched or straight-chain alkyl of 1 to 17 carbon atoms, chlorine, or phenyl which is unsubstituted or substituted by alkyl, alkoxy or chlorine, or are each haloalkyl, hydroxyalkyl, a carboxylic ester group or a carboxamide group, R^4 and R^5 can be identical or different and are each a branched or straight-chain alkyl, alkoxy or alkylthio group of 1 to 4 carbon atoms, R^6 is hydrogen, an alkoxy or alkylthio group of 1 to 6 carbon atoms, dialkylamino where alkyl is of 1 to 6 carbon atoms or branched or straight-chain alkyl of 1 to 12 carbon atoms, n is 1, 2 or 3 and R^7 is alkyl of 1 to 4 carbon atoms.

4,559,399
POLYMER MODIFIED CYANATE AND/OR CYANAMIDE COMPOSITIONS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 652,984, Sep. 21, 1984, abandoned. This application Mar. 11, 1985, Ser. No. 710,210

Int. Cl.⁴ C08G *59/40, 73/06*

U.S. Cl. 528—120 **18 Claims**

1. A composition comprising

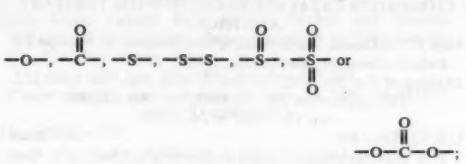
(A) from about 0.1 to about 50 percent by weight of at least one alkenylphenyl cyanate represented by formula I in the specification;

(B) from about 10 to about 99 percent by weight of at least one aromatic polycyanate or aromatic polycyanamide or mixture thereof represented by formulas II, III, IV or V in the specification; and

(C) from 1 to about 50 percent by weight of at least one polymerizable ethylenically unsaturated material;

wherein the percent by weight of the components is based upon total weight of the components (A), (B) and (C).

6. A composition of claims 1, 2 or 3 wherein from about 1 to about 99 pbw of a polyepoxide represented by formulas XVII, XVIII, XIX or XX in the specification wherein each A is independently a divalent hydrocarbon group having from 1 to about 10 carbon atoms,



each A′ is independently a divalent hydrocarbon group having from 1 to about 6 carbon atoms or a

group; p has a value of from zero to about 10; each R′ is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; each R″ is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; m has a value of from about zero to about 30; n has a value of zero or 1; n″ has a value of from about 0.001 to about 6; x has a value of 4 and x′ has a value of 3 is present.

4,559,400
POLYMER FROM AROMATIC DIAMINE AND N,N,N′,N′-TETRAGLYCIDYL-1,3-PROPYLENE BIS(P-AMINOBENZOATE)

David W. Wang, Vestel, N.Y., and Daniel R. Draney, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 518,856, Aug. 1, 1983, Pat. No. 4,518,786. This application Feb. 6, 1985, Ser. No. 677,135

Int. Cl.⁴ C08G *69/08*

U.S. Cl. 528—327 **2 Claims**

1. The resinous polymer from N,N,N′,N′-tetraglycidyl-1,3-propylene bis(p-aminobenzoate) and an aromatic polyamine.

4,559,401
PROCESS FOR PREPARING CHROMOPHORE-SUBSTITUTED VINYL-HALOMETHYL-S-TRIAZINES

William Rowe, Califon; Thomas Dooley, Teaneck, and Ajay Shah, Elizabeth, all of N.J., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Jun. 4, 1984, Ser. No. 617,042

Int. Cl.⁴ C07D *251/24*

U.S. Cl. 544—216 **5 Claims**

1. In a process for preparing 2-(p-methoxystyryl)4,6-bis(trichloromethyl)-s-triazine by reaction of 2,4-bis(trichloromethyl)-6-methyl-s-triazine with p-anisaldehyde in toluene in the presence of a condensation catalyst; the improvement which comprises using in said reaction a toluene solution of the 2,4-bis(trichloromethyl)-6-methyl-s-triazine obtained by dissolving in toluene a crude reaction product mixture of the 2,4-bis(trichloromethyl)-6-methyl-s-triazine produced by reaction of an admixture of trichloroacetonitrile and acetonitrile with hydrogen chloride in the presence of a Friedel-Crafts catalyst, passing an inert gas through said toluene solution to remove excess hydrogen chloride, adding water to said toluene, separating insoluble Friedel-Craft catalysts therefrom, and recovering said toluene solution of 2,4-bis(trichloromethyl)-6-methyl-s-triazine.

4,559,402

PYRAZOLOPYRIDINES AND TETRAHYDRO PYRAZOLOPYRIDINES

Tsutomu Irikura, Tokyo; Seigo Suzue, Saitama; Hideo Okubo, and Katsuya Awano, both of Ibaragi, all of Japan, assignors to Kyorin Seiyaki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,381
Claims priority, application Japan, Mar. 26, 1983, 58-51053
Int. Cl.[4] C07D *487/04*
U.S. Cl. 546—121 9 Claims

6. 2-Methyl-3-(1-ethyl-1,4,5,6-tetrahydronicotinoyl)-pyrazolo[1,5-a]pyridine.

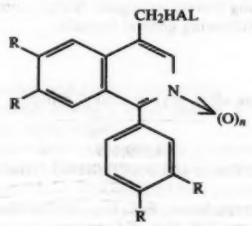
4,559,403

SUBSTITUTED ISOQUINOLINES

Hans Bruderer, Biel-Benken, Switzerland; Richard W. Kierstead, North Caldwell; John G. Mullin, Jr., Hawthorne, both of N.J.; Keiji Nakamura, Kamakura; Mitsuru Tateishi, Atsugi, both of Japan; Sidney Teitel, Clifton, and Jay P. O'Brien, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 496,327, May 19, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,262
Int. Cl.[4] C07D *217/16*
U.S. Cl. 546—144 8 Claims

7. A compound of the formula



wherein R is lower alkoxy, n is the integer zero or 1, and HAL is halogen.

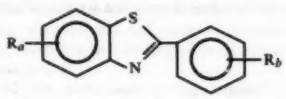
4,559,404

PREPARATION OF ETHYNYL SUBSTITUTED 2-PHENYLBENZOTHIAZOLES

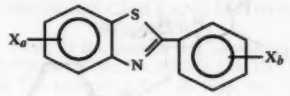
Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 356,576, Mar. 9, 1982, Pat. No. 4,442,293. This application Dec. 28, 1983, Ser. No. 566,354
Int. Cl.[4] C07D *277/66*
U.S. Cl. 548—152 5 Claims

1. A method for making a compound of the formula



wherein R_a and R_b are —H or —C≡CH, wherein at least one of said R_a or R_b is —C≡CH, which comprises the steps of (1) reacting a halogen-substituted 2-phenylbenzothiazole of the formula



II

wherein X_a and X_b are —H or a halogen selected from the group consisting of —Br, —I and —F, wherein at least one of said X_a or X_b is a halogen, with 2-methyl-3-butyn-2-ol in the presence of catalytic amounts of dichlorotriphenylphosphine palladium II, triphenylphosphine and cuprous iodide, (2) treating the resulting adduct with a strong base in a suitable solvent to displace acetone therefrom, and (3) recovering the desired compound.

4,559,405

PROCESS FOR PREPARING SUBSTITUTED PHTHALIC ANHYDRIDES

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 16, 1984, Ser. No. 600,248
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—240 8 Claims

1. A process for preparing 4-methylphthalic anhydride which comprises reacting 4-methyl-1,2,3,6-tetrahydrophthalic anhydride with bromine in the presence of an acid acceptor.

5. A process for preparing 4-methylphthalic anhydride which comprises:

(a) reacting isoprene and maleic anhydride to form 4-methyl-1,2,3,6-tetrahydrophthalic anhydride;

(b) reacting the 4-methyl-1,2,3,6-tetrahydrophthalic anhydride with bromine in the presence of an acid acceptor.

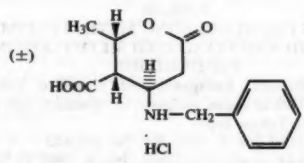
4,559,406

PROCESS FOR THE PREPARATION OF AMINOLACTONE CARBOXYLIC ACID

Károly Lempert; Gábor Doleschall; József Fetter; Gyula Hornyák; József Nyitrai; Gyula Simig, all of Budapest, and Károly Zauer, Szentendre, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyav R.T., Budapest, Hungary

Filed Jun. 27, 1983, Ser. No. 508,436
Claims priority, application Hungary, Jul. 30, 1982, 2449
Int. Cl.[4] C07D *309/30*
U.S. Cl. 549—291 10 Claims

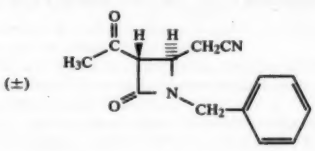
6. A process for the preparation of a salt of the Formula (I)



(I)

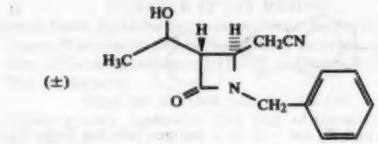
which comprises the steps of:

(a) reducing a compound of the Formula (III)



(III)

to yield a compound of the Formula (II)



(II)

and

(b) treating the compound of the Formula (II) with concentrated aqueous hydrogen chloride solution to yield the desired product.

4,559,407

INTERMEDIATE IN THE PRODUCTION OF VITAMIN E

Richard Barner, Witterswil, and Josef Hübscher, Seon, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

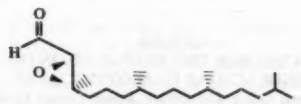
Filed Oct. 11, 1983, Ser. No. 540,253

Claims priority, application Switzerland, Oct. 27, 1982, 6270/82

Int. Cl.⁴ C07D *303/32*

U.S. Cl. 549—548 **1 Claim**

1. The compound of the formula



V

4,559,408

PROCESS FOR STABILIZING METHYLENEIMINE COMPOUND AND STABILIZED METHYLENEIMINE COMPOSITION

Toshiaki Nishimura, Kanagawa, and Masahiro Kurokawa, Hiratsuka, both of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

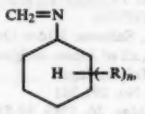
Filed Jan. 3, 1985, Ser. No. 688,653

Claims priority, application Japan, Jan. 6, 1984, 59-583

Int. Cl.⁴ C07C *85/26*

U.S. Cl. 564—2 **17 Claims**

1. A process for stabilizing a cyclohexylmethyleneimine compound represented by the following general formula:

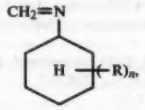


wherein R is an alkyl group bonded to individual carbon atom of the cyclohexyl ring and n is an integer of 0 to 5, which comprises adding thereto an organic lithium compound represented by the following general formula:

R'—Li,

wherein R' is an alkyl, aryl or aralkyl group.

2. A process for stabilizing methyleneimine compounds containing a cyclohexylmethyleneimine compound represented by the following general formula as an essential component:



wherein R is an alkyl group bonded to individual carbon atom of the cyclohexyl ring and n is an integer of 0 to 5, which comprises adding thereto an organic lithium compound represented by the following general formula:

R'—Li,

wherein R' is an alkyl, aryl or aralkyl group.

4,559,409

PROCESS FOR MANUFACTURING GUANYLUREA SULFAMATE

Joachim V. Seyerl, Seeon, Fed. Rep. of Germany, assignor to SKW Trostberg, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,253

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243980

Int. Cl.⁴ C07C *127/15*

U.S. Cl. 564—59 **11 Claims**

1. Process for reacting equimolar amounts of dicyandiamide, sulfaminic acid and water to produce guanylurea sulfamate in high yields in excess of about 90%, comprising the steps of:

(a) providing a solution or suspension of dicyandiamide in water or a water/organic solvent mixture;

(b) heating said solution or suspension to a temperature within the range of 70° C. to 105° C.;

(c) adding sulfaminic acid to said heated solution or suspension to provide a reaction medium containing at least a stoichiometrically-necessary amount of water;

(d) controlling the temperature of said reaction medium within the range of 70° C. to 105° C. for a sufficient period of time to form guanylurea sulfamate, and

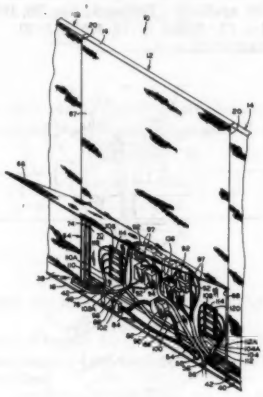
(e) removing residual water or water/organic solvent mixture to dry said guanylurea sulfamate in a yield greater than about 90% based upon the weight of said reactants.

4,559,410

ACCESS PANEL

David L. Hostetter, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Filed Feb. 28, 1984, Ser. No. 584,327
Int. Cl.[4] H02G 3/00
U.S. Cl. 174—48 16 Claims



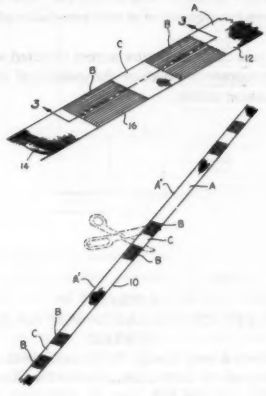
1. A space-divider wall system comprising:
a partition member having a lower portion, a bottom edge and opposite lateral edges;
a raceway with relative dimensions to accommodate a plurality of power, communication and data cables, and extending across the bottom edge of said partition member to one or more adjacent partition members connected edgewise to respective opposite lateral edges of said partition member, said raceway having a plurality of openings therein adapted for the ingress and egress of said cables;
a compartment in said partition member lower portion disposed above and in communication with said raceway, said compartment having a displaceably mounted front wall for user access to the compartment, and a plurality of spaced-apart interior walls;
an electrical junction box mounted on one of said interior walls;
conduits carrying power cables from external sources and/or from other partition members in the wall system connected to said electrical junction box, said conduits extending from said electrical junction box to said raceway;
a support plate member having a front and a back surface, said back surface having a cooperating releasable mounting means for releasably mounting said support plate member to one of said interior walls;
a communication junction box fixedly attached to said support plate member;
a plurality of communication cables connected to said communication junction box, said communication cables extending to and from said communication junction box to said raceways; and
a plurality of data cables each having terminal ends releasably connected together, and means for releasably attaching said connected together terminal ends to the front surface of another of said support plate members, said data cables extending from said other support plate member to and from said raceway.

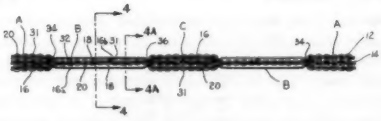
4,559,411

UNITARY WOVEN JACKET AND ELECTRICAL TRANSMISSION CABLE AND METHOD FOR PRODUCTION

Douglas E. Piper, 21 Buckingham Rd., Greenville, S.C. 29607

Continuation-in-part of Ser. No. 466,564, Feb. 15, 1983, Pat. No. 4,460,803. This application Jun. 28, 1984, Ser. No. 625,660
Int. Cl.[4] H01B 7/08; D03D 15/00
U.S. Cl. 174—117 M 23 Claims





1. A jacketed woven transmission cable comprising:
a woven electrical transmission cable including a number of warp conductor elements for transmitting electrical signals interwoven with a cable weft element;
a tubular woven cover about said woven electrical transmission cable in an open tubular configuration which includes cover warp elements interwoven with a cover weft yarn element around said woven cable;
said woven cover and woven transmission cable being connected together by weaving said cable and cover together at predetermined picks of one of said weft elements to provide a unitary construction;
a non-jacketed section at each end of said cable wherein said cover warp and said cover weft elements are woven in a closed flat weave structure which closes said tubular configuration of said woven cover at the beginning of said non-jacketed sections; and
said warp conductor elements being woven through said flat closed weave structure of said woven cover at said non-jacketed sections lying on either side of said flat weave structure in a separated unbound configuration so that said conductor elements may be terminated and said woven cover is closed,
where said warp conductor elements are terminated.

4. A method of producing individual woven jacketed electrical transmission cables comprising:
weaving a continuous length cable structure which includes a plurality of said jacketed cable sections and a plurality of non-jacketed cable sections;
weaving said jacketed cable sections by weaving a woven cable having a number of warp conductors for transmitting electrical signals together with a weft element, simultaneously weaving a tubulr woven cover in an open tubu-

lar configuration by weaving cover warp and cover weft elements around said woven cable, and interweaving said woven cable and woven cover at selected points of weaving to provide a one-piece construction;

weaving said non-jacketed cable sections by reducing the weaving of said woven cover from an open tubular weave to a closed flat weave and breaking out said warp conductors through said woven cover and floating said warp conductors on either side of said flat weave in a separated unwoven configuration in said non-jacketed cable section; and

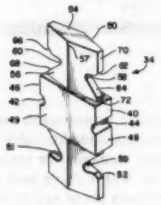
severing said cable structure across selected sections of said cable structure to produce the individual woven jacketed transmission cables.

4,559,412

COIL SUPPORT INSULATOR FOR AN ELECTRIC HEATER

H. Keith Howard, and Jimmy L. Sherrill, both of Cookeville, Tenn., assignors to Tutco, Inc., Cookeville, Tenn.

Division of Ser. No. 206,899, Nov. 14, 1980, Pat. No. 4,458,141.
This application Apr. 6, 1984, Ser. No. 597,701
Int. Cl.[4] H01B *17/56;* H05B *3/32*
U.S. Cl. 174—138 J 6 Claims



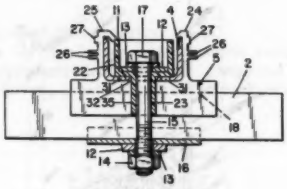
1. An insulating support for a heater coil comprising a body portion, a first retaining member extending from said body portion in a first direction, said first retaining member having a first dimension and a second dimension in a plane transverse to said first direction, said first dimension being greater than the spacing between adjacent convolutions of a heater coil and said second dimension being transverse to said first dimension and smaller than said first dimension, said first retaining member having first and second notches therein, said first and second notches extending along said first dimension from an inner part of said first retaining member in opposed directions transverse to said first direction and outwardly toward respective outer surfaces of said first retaining member, and first and second guide surfaces oblique to said first direction adjacent each of said first and second notches, each first guide surface connecting an upper portion of a respective one of said first and second notches to the adjacent outer surface and each second guide surface connecting a lower portion of a respective one of said first and second notches to the adjacent outer surface, said first and second guide surfaces at each notch cooperating to secure a respective single convolution of a heater coil in each of said first and second notches when a heater coil is at operating and non-operating temperatures and to allow easy insertion of a respective convolution into each of said first and second notches.

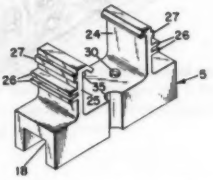
4,559,413

RAIL INSULATOR FOR THE SECURING OF A CONDUCTOR RAIL ON A RAIL SUPPORT

Jorgen Logstrup, Snekkersten, and Preben C. Sparre, Espergaerde, both of Denmark, assignors to A/S Logstrup-Steel, Snekkersten, Denmark

PCT No. PCT/DK83/00076, § 371 Date Mar. 12, 1984, § 102(e) Date Mar. 12, 1984, PCT Pub. No. WO84/00842, PCT Pub. Date Mar. 1, 1984
PCT Filed Aug. 12, 1983, Ser. No. 598,330
Claims priority, application Denmark, Aug. 20, 1982, 3733/82
Int. Cl.[4] H01B *17/18;* H02G *5/00*
U.S. Cl. 174—163 R 2 Claims





1. A rail insulator for the securing of a conductor rail on a rail support, which rail support comprises a substantially U-shaped supporting rail having rows of regularly spaced holes, the rail insulator comprising: a body portion having a bottom, a top, two sides, and two ends, said bottom of said body portion having a notch extending thereacross from one end of the body portion to the other end of the body portion for receiving the edge of a conductor rail, said body portion on its top having upwardly-extending, hook-shaped holding elements which are arranged to grip around and be secured to the rail support; and a guide stud located on the top of said body portion between the holding elements for fitting into one of the holes of the rail support.

4,559,414

ELECTROLYTIC CORROSION RESISTANT INSULATOR

Kuniji Kito, Nagoya; Akihiro Watanabe, Hashima, and Shigeo Mori, Kuwana, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 7, 1984, Ser. No. 638,366
Claims priority, application Japan, Aug. 26, 1983, 58-156629
Int. Cl.[4] H01B *17/08, 17/38*
U.S. Cl. 174—196 10 Claims

1. An electrolytic corrosion resistant insulator comprising:

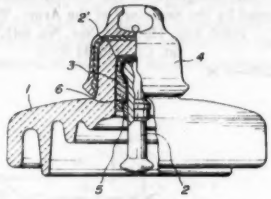
an insulator body having a cavity therein;

a pin located within said cavity of the insulator body, a portion of said pin being secured therein by cement;

a sacrificial anode surrounding said pin at an intermediate portion thereof, said sacrificial anode being partially covered by said cement and protruding radially from said pin; and

a synthetic resin electric insulating film being lamination-

attached to the pin and covering substantially the entire outer surface of the portion of the pin which is secured

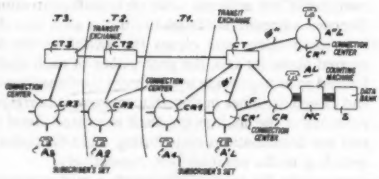


within said cavity by cement, said electric insulating film also covering a portion of said sacrificial anode.

4,559,415
CHARGING PROCESS FOR SELLING INFORMATION BY TELEPHONE

Alain Bernard, 4 bis rue Alexandre Bontemps, 78000 Versailles, and Didier Dupraz, 4 rue Denfert Rochereau, 92600 Asnières, both of France

Filed Feb. 2, 1984, Ser. No. 576,429
Claims priority, application France, Feb. 4, 1983, 83 01775
Int. Cl.[4] H04M *15/32*
U.S. Cl. 179—2 DP **3 Claims**



1. A charging process for selling information via a telephone network in which a data bank is connected via said network with calling subscribers, said data bank having a telephone number and means for supplying a spoken message, wherein said process comprises the steps of:

supplying from said data bank a message to any calling subscriber as of the time at which a call from said subscriber is received;

giving to the message supplied by said data bank a fixed duration;

allocating to said data bank a number which, for the telephone network, is considered to correspond to a time-based charge based on a certain charge band, said number also implying a routing of the call via time-based charging means;

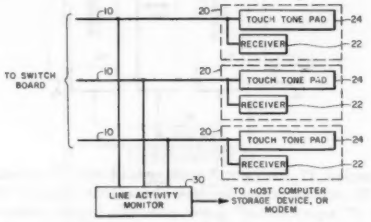
choosing said fixed duration of the message and the charge band in such a way that the total of the charge charged to the calling subscriber for receiving the complete message contains an extra charge of at least one unit compared with the charge which would have been made to him for a call of the same duration with a subscriber belonging to the same local distribution area as the data bank;

counting the number of calls to which the data bank has replied and deducting the number of extra charges charged therefrom, and calculating the proportion of the charges attributable to the data bank.

4,559,416
TELEPHONE LINE ACTIVITY MONITOR

Peter F. Theis, McHenry, and Gregory D. Buchberger, Mount Prospect, both of Ill., assignors to Morgan Industries, Inc., Curnee, Ill.

Filed Oct. 12, 1983, Ser. No. 541,366
Int. Cl.[4] H04M *15/32*
U.S. Cl. 179—7.1 R **21 Claims**



1. An apparatus for monitoring line activity on at least one telephone line which carries incoming telephone calls from a calling party to a called party, said apparatus comprising:

a called party answering system comprising an operator station for servicing incoming calls on the telephone line, said operator station comprising means for transmitting voice messages between the telephone line and a called party operator;

a line activity monitor coupled to the telephone line to record information indicative of usage of the telephone line;

a signaling device, included in the called party answering system, for generating a plurality of called party selected coded signals following receipt of respective incoming calls on the telephone line, each of said coded signals indicative of coded information selected by the called party to be associated with respective incoming calls in order to classify the incoming calls;

means for supplying the coded signals as inputs to the monitor; and

means, included in the monitor, for associating said coded signals with respective calls such that the monitor is responsive to the coded signals and said recorded information varies in accordance with the coded signals.

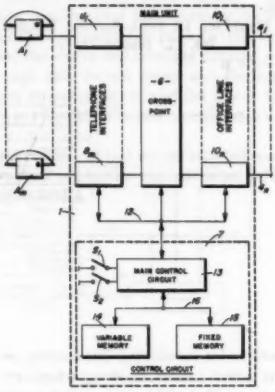
4,559,417
METHOD OF SETTING OPERATING DATA IN A KEY TELEPHONE SYSTEM

Isaku Komuro, Higashiyamato; Hideyasu Mori, and Yoshikazu Sano, both of Hino; all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 8, 1983, Ser. No. 530,266
Claims priority, application Japan, Sep. 18, 1982, 57-162917
Int. Cl.[4] H04Q *5/00*; H04M *1/00*
U.S. Cl. 179—99 LS **9 Claims**

1. In a key telephone system comprising memory means for storing operating data which registers the capability of key telephone sets to perform each of a plurality of functions, and a plurality of key telephone sets each capable of performing at least one of the functions in accordance with the stored operat-

ing data, a method comprising the step of simultaneously displaying, at a predetermined one of the key telephone sets, the



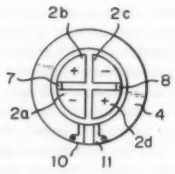
registered capability of a plurality of the key telephone sets to perform at least one of the functions.

4,559,418

CERAMIC MICROPHONE

Nobuomi Imai, Tokyo, Japan, assignor to Primo Company Limited, Mitaka, Japan

Filed Oct. 5, 1983, Ser. No. 539,316
Claims priority, application Japan, Oct. 8, 1982, 57-152078
Int. Cl.⁴ H04R *19/04*
U.S. Cl. 179—111 E **3 Claims**



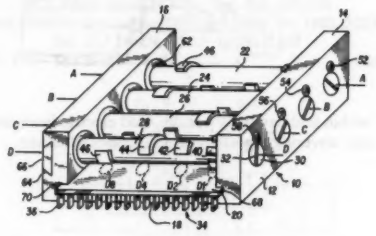
1. A ceramic microphone comprising;
a diaphragm for receiving sound waves;
a thin ceramic plate attached to said diaphragm for transducing said sound waves to electric signals;
electrode means for taking out the transduced electric signals, said electrode means comprising a plurality of electrodes on each of the opposite sides of said ceramic plate, said plurality of electrodes being polarized so that each of a pair of said electrodes faced across said ceramic plate forms a capacitor and the opposite-polarity electrodes of each of said capacitors are serially connected to each other; and
a FET amplifying circuit connected to said electrode means an in a casing of the microphone.

4,559,419

CODING SWITCH ASSEMBLY

David L. Overman, and William L. Konick, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1984, Ser. No. 641,109
Int. Cl.⁴ H01H *9/00*
U.S. Cl. 200—5 R **20 Claims**



1. Apparatus for setting and displaying a numerical value to be encoded to an electronic device, comprising:
a switch assembly including a plurality of pressure actuated membrane switches arranged in straight rows of at least four switches and including electrically conductive means for connecting said switches to said electronic device;
a plurality of switch actuator shafts, the number of said shafts being equal to the number of said rows, said shafts having longitudinal axes disposed in a common plane and extending respectively parallel and adjacent to said rows, each shaft including a plurality of raised annular protrusions corresponding respectively to the at least four switches of the adjacent row, each shaft protrusion being disposed adjacent one of said switches such that the shaft protrusion opens and closes the switch as the shaft is rotated about its axis, the protrusions of each shaft being formed so as to provide ten different combinations of open and closed switches in the adjacent row at corresponding positions of the shaft as the shaft is rotated about its axis, said ten combinations constituting multi-bit codes corresponding to the numbers 0–9, respectively;
support means for rotatably supporting said actuator shafts such that each shaft is manually rotatable by an operator about its axis; and
numerical value display means for displaying the numerical value to be encoded to the electronic device, comprising a plurality of shaft setting display means associated respectively with said actuator shafts, each shaft setting display means displaying one of the ten numbers 0–9 corresponding to the multi-bit code produced by its associated shaft in the adjacent row of membrane switches, said numbers displayed by the plurality of shaft setting display means being oriented so that they are readable by the operator as a discrete number in standard decimal format constituting the numerical value to be encoded to the electronic device.

4,559,420

OMNIDIRECTIONAL CHANGEOVER SWITCH

Toshiaki Yamada, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

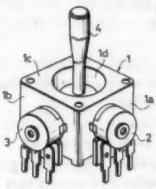
Filed Oct. 12, 1984, Ser. No. 660,504
Claims priority, application Japan, Oct. 14, 1983, 58-157939[U]
Int. Cl.⁴ H01H *19/08*
U.S. Cl. 200—6 A **3 Claims**

1. An omnidirectional changeover switch comprising:
(a) casing having adjacent sides;
(b) at least a pair of switch units mounted respectively on

said sides and having movable slider supports, respectively;

(c) a control lever mounted in said casing; and

(d) interlink members disposed in said casing and movable about their own axes extending in substantially perpendicular relation to each other, said control lever being operatively connected to said slider supports through said interlink members, each of said switch units comprising an insulating base and supporting a pair of sliders slidable on said insulating base, said each base further comprising a collector held in contact with one of said sliders at all times, and a pair of contacts capable of contacting the other slider and having ends held in confronting relation to each other, said collector and said contacts being printed as patterns on said insulating base.

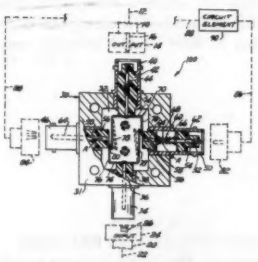


4,559,421

ELECTRICAL CONNECTOR INCLUDING A MAKE-BEFORE-BREAK SWITCH ARRANGEMENT

James A. Lapke, Shelton, and Carl W. Schmelzle, Westport, both of Conn., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 5, 1984, Ser. No. 586,470
Int. Cl.⁴ H01R *33/30*
U.S. Cl. 200—51.1 **6 Claims**



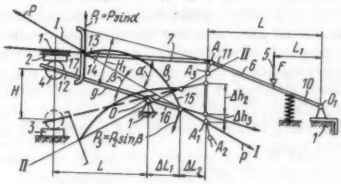
1. An electrical connector, characterized by an enclosure, a first and a second contact member comprised of electrically conductive material mounted to said enclosure in electrical isolation thereto, transmitting means connected to said contact members and defining a first electrical circuit path for transmitting an electrical signal between the contact members, and make-before-break switch means for making a second electrical circuit path between said contact members before breaking said first electrical circuit path, said transmitting means comprising a first contactor secured to the first contact member and a second contactor secured to the second contact member, each of said contactors being comprised of electrically conductive material and including a first leg and a second leg, the first leg and the second leg of one of said contactor being in electrical circuit relation, respectively, with the second leg and the first leg of the other said contactor, each said second leg being normally biased against its associated first leg and adapted to move from a contacting first position completing the first electrical circuit path to a non-contacting second position completing the second electrical circuit path.

4,559,422

MICROSWITCH

Vyacheslav G. Mironenko, ulitsa Stromynka, 11, korpus 2 kv. 120, Moscow; Alexandr P. Poltorak, ulitsa Schorsa, 25, kv. 1, Donetsk; Vitaly I. Schutsky, ulitsa Profsojuznaya, 75, korpus 1, kv. 34, Moscow; Vladimir A. Kosovtsev, prospekt Traktorostroitelei, 77, kv. 335, Kharkov; Fedor P. Chaly, prospekt Traktorostroitelei, 158, kv. 120, Kharkov; Vladislav F. Zagubeljuk, ulitsa Georev truda, 47, kv. 45, Kharkov; Nikolai I. Filatov, ulitsa Sovetskaya, 6, Kizlyar, poselok Komsomolsky, Dagestanskaya; Vadim V. Emelyanenko, bulvar Shevchenko, 125 kv. 20, Donetsk; Valentin V. Morgunov, prospekt Dzerzhinskogo 53, kv. 51, Donetsk; Eduard S. Rozental, ulitsa Kirova, 32, kv. 10, Moscow, and Vladimir I. Litvinov, bulvar, Shevchenko, 69 kv. 4, Donetsk, all of U.S.S.R.

PCT No. PCT/SU82/00019, § 371 Date Feb. 13, 1984, § 102(e) Date Feb. 13, 1984, PCT Pub. No. WO84/00248, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 21, 1982, Ser. No. 598,352
Int. Cl.⁴ H01H *21/44*
U.S. Cl. 200—67 D **1 Claim**



1. A microswitch comprising: an insulating base; fixed contacts secured on the insulating base; a movable contact adapted for selectively engaging the fixed contacts; and means for shifting the movable contact, which means include an actuating lever, an intermediate lever, a flat spring, and a contact lever all connected in series with one another, said actuating lever and said contact lever being secured to the insulating base so as to be able to turn at desired angles, the ends of said intermediate lever and of said flat spring being connected with one another and bearing against a limit stop, and said contact lever having a free end supporting said movable contact, characterized in that one end of said flat spring is connected with the end of said intermediate lever and bears against said limit stop located at the end of said contact lever supporting said movable contact, whereas the other end of said flat spring is connected with the other end of said contact lever lying opposite to said end carrying said movable contact, so that the fixation point of said contact lever on said insulating base is located between the two ends of said flat spring, while the point of connection of the end of said flat spring with the end of said contact lever is located between the point of connection of said actuating lever with said intermediate lever and the fixation point of said contact lever on said insulating base.

4,559,423

CIRCUIT INTERRUPTER

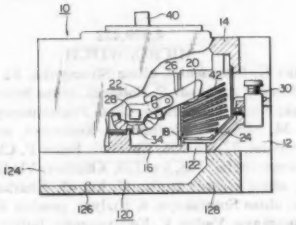
Shinji Yamagata; Shigemi Tamaru; Hiroshi Fujii, all of Fukuyama; Hideo Suhara, Hiroshima; Fumiyuki Hisatsune, Fukuyama; Setsuo Hosogai, Fukuyama, and Kiyomi Yamamoto, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,504

Claims priority, application Japan, Apr. 28, 1983, 58-65224[U]; May 10, 1983, 58-82931; May 11, 1983, 58-71283[U]; May 12, 1983, 58-84303

Int. Cl.[4] H01H *33/04*

U.S. Cl. 200—144 R **7 Claims**



1. A circuit interrupter comprising;

a pair of separable contacts defining, when separated, an arcing region therebetween;

an operating mechanism for opening and closing said separable contacts; and

a housing enclosing said separable contacts and said operating mechanism, said housing having an electrically insulating housing bottom wall and having a gas exhaust passage disposed in said housing bottom wall;

said gas exhaust passage having an inlet opening located in said housing bottom wall in a position effective for exhausting an arced gas generated in the arcing region without the arced gas contacting the operating mechanism,

said housing bottom wall comprising a bottom wall defining the inner surface of the housing bottom wall, and a channel block attached to said bottom wall and defining the outer surface of the housing bottom wall, said gas exhaust passage being formed between said bottom wall and said channel block.

4,559,424

DISCONNECT SWITCH FOR HIGH-VOLTAGE SWITCHING INSTALLATION

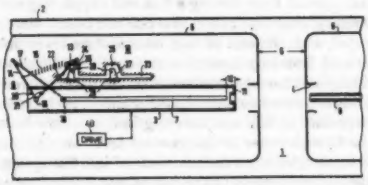
Dieter Lorenz, and Willi Olsen, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1984, Ser. No. 640,997

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1983, 3329555

Int. Cl.[4] H01H *33/12*

U.S. Cl. 200—146 R **9 Claims**



1. A switch assembly in a metal-encapsulated switching installation filled with compressed insulating gas and having a pair of hollow electrodes spaced from one another by an isolating space, said switch assembly comprising:

a tubular fixed contact disposed in one of the hollow electrodes;

a tubular movable main switching contact disposed in the other of said hollow electrodes, said movable contact being shiftably mounted to bridge the isolating space and electrically engage said fixed contact;

drive means operatively linked to said movable main switching contact for it alternately toward and away from said fixed contact;

a tubular mating contact disposed in said one of said hollow electrodes, said mating contact being at the same potential as said fixed contact;

an auxiliary switching pin movably mounted inside said movable main switching contact, said auxiliary switching pin being couplable to said mating contact for forming an electrically conductive connection thereto by movement faster than the movement of said movable main switching contact;

a first shaft mounted to the movable main switching contact, said shaft extending outwardly of said movable main switching contact;

an elastic spring drive for the auxiliary switching pin, said elastic spring drive being pivotably mounted on an outer part of the first shaft, the elastic spring drive comprising a first and a second lever which are connected by a hinged spring pivotably coupled at one end to said first lever and at an opposite end to said second lever;

a guide roller rotatably connected to the second lever, which roller is controlled mechanically by cocking means to effect the respective loading of the hinged spring;

arresting means for limiting the first lever in its angular movement, said first lever being held by the spring as far as its fully loaded position in one of two end positions corresponding to the switch-on or switch-off position of the movable main switching contact; and

a third lever pivotably coupling the first lever to the auxiliary switching pin which is mounted on a second shaft connected to the auxiliary switching pin, said second shaft being guided in slots of the movable main switching contact.

4,559,425

COMPRESSED-GAS BREAKER

Heinz-Peter Kirchesch, Fislisbach; Wilhelm Nürck, Dielsdorf, and Wolfgang Widl, Glattbrugg, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 13, 1984, Ser. No. 650,058

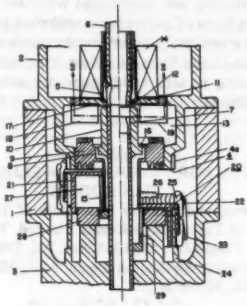
Claims priority, application Switzerland, Oct. 28, 1983, 5837/83

Int. Cl.[4] H01H *33/12*

U.S. Cl. 200—146 R **12 Claims**

1. A compressed-air breaker comprising two coaxial contact members which are movable with respect to each other along one axis, each contact member being provided with an arcing contact, said arcing contacts movable to a breaking position of separation to form an arcing volume therebetween, a coil, through which breaking current flows, an arcing ring electrically conductively connected to said coil, a heating chamber surrounding said arcing contacts for storing quenching gas, said heating chamber being in gas communication with said arcing volume, a gas guiding device coaxial with said contact members disposed in said heating chamber, said gas guiding

device having at least three ducts distributed azimuthally around said one axis and opening radially about said axis to



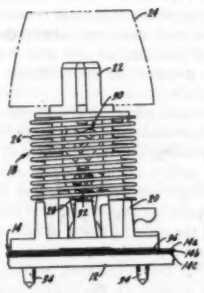
provide communication between said heating chamber and arcing volume.

4,559,426

MEMBRANE SWITCH AND COMPONENTS HAVING MEANS FOR PREVENTING CREEP

Anthony J. Van Zeeland; Willis A. Larson, and David A. Christensen, all of Crystal Lake, Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Nov. 3, 1980, Ser. No. 203,708
Int. Cl.⁴ H01H *3/12*
U.S. Cl. 200—159 B **14 Claims**



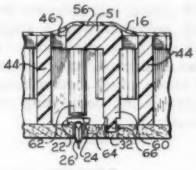
1. In a membrane switch of the type having a membrane and substrate, each with electrical conductors formed thereon, a spacer having an opening therein disposed between the membrane and substrate, with the membrane being movable, in response to selectively applied pressure, through a spacer opening into contact with an electrical conductor on the substrate, and means for preventing creep of the membrane, caused by maintained tension thereon from selectively applied pressure thereto, including a patch of low creep material affixed to the membrane at those portions of the membrane which are subject to creep.

4,559,427

KEYBOARD SYSTEM AND MODULE THEREFOR

Richard G. Dolson, Canton, and William R. Brophy, West Simsbury, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Oct. 19, 1983, Ser. No. 543,390
Int. Cl.⁴ H01H *13/52*
U.S. Cl. 200—159 B **12 Claims**



1. A keyboard system for an electronic voting machine or the like comprising:

a circuit board having a matrix of contact switches of a type employing a spring contact, each of said switches being associated with a corresponding alignment recess in said circuit board;

a matrix module mounted to said circuit board, said matrix module comprising a base, an upper support frame, and a matrix of keys, each key being associated with a corresponding contact switch and comprising an elongated resilient structure extending substantially parallel to the circuit board, said key including an upper contact button, a vertically extending alignment peg received in a corresponding alignment recess, and a vertically extending contact peg, the end of which is depressable against a corresponding spring contact of a contact switch; and

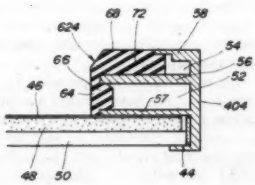
a membrane overlying said support frame wherein depressing of a selected location of said membrane results in the actuation of a corresponding contact switch.

4,559,428

OVEN DOOR WITH INTEGRAL CHOKE MECHANISM AND MICROWAVE ABSORBER

Koichi Takeuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 294,246, Aug. 19, 1981, abandoned.
This application Sep. 30, 1983, Ser. No. 537,167
Claims priority, application Japan, Aug. 26, 1980, 55-121351[U]
Int. Cl.⁴ H05B *6/76*
U.S. Cl. 219—10.55 D **4 Claims**



1. An oven door for a microwave oven said oven comprising walls having front ends juxtapositioned to said door when said door is closed comprising in combination:

a door frame including:

a first support section for supporting a fender member including a windowpane,

first and second partition walls for defining a choke mechanism area, and

a second support section extending from an disposed adjacent said first partition wall external

to said choke mechanism area, said second support section having a stepped portion; and

a choke cover secured to said door frame made of a microwave absorbing material, said choke cover including a choke cover section for closing off said choke mechanism area when said choke cover is secured to said door frame and an extended portion of said choke cover which confronts said front ends of said walls of said oven when said oven door is closed, said extended portion of said choke cover being provided with a stepped portion which meshes with said stepped portion of said second support section when said choke cover is secured to said door frame, said choke cover section being integral with said extended portion and comprising the same microwave absorbing material.

4,559,429

MICROWAVE COUPLER AND METHOD

Cressie E. Holcombe, Farragut, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1984, Ser. No. 676,342

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 F **6 Claims**

1. A microwave coupler in combination with a microwave energy source for converting microwave energy emanating from said source into heat, said microwave coupler consisting of a material having an alpha-rhombohedral-boron-derivative structure in which the boron content is greater than about 73 atomic percent and with said material being disposed to intercept microwave energy from said source.

4,559,430

METHOD FOR PERFORMING AUTOMATIC CIRCUMFERENTIAL WELDING

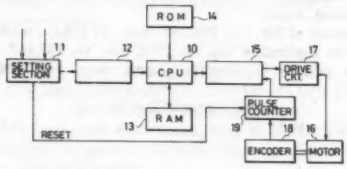
Yoshitaka Hayakawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,241

Claims priority, application Japan, Oct. 7, 1983, 58-187828

Int. Cl.⁴ B23K *9/10*

U.S. Cl. 219—61 **4 Claims**



1. A method for performing automatic circumferential welding, comprising the steps of:

A. performing an initial set-up operation by:

(1) moving a welding head around a welding circumference while producing pulses in a number proportional to an amount of movement of said welding head in a welding direction around said circumference;

(2) counting said pulses for one complete revolution of said welding head;

(3) specifying along said welding circumference, in the form of angles from a start point, a plurality of division positions at which welding conditions are to change; and

(4) converting said respective angles into the form of pulses from said start point; and

B. for a welding operation:

(1) moving said welding head around said welding circumference from said start point while producing pulses in a number proportional to an amount of movement of said welding head in said welding direction;

(2) counting said pulses to produce a pulse count;

(3) comparing said pulse count with said respective angles in the form of pulses from said start point; and

(4) when said pulse count reaches each of said respective angles in the form of pulses from said start point, instructing to said welding head a new set of welding conditions.

4,559,431

APPARATUS FOR PRODUCING WELDED METALLIC CAN BODIES

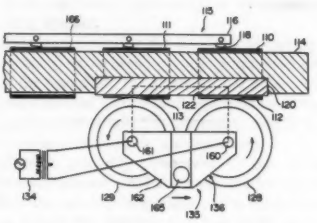
Kenji Matsuno, and Kazuma Kuse, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,294

Claims priority, application Japan, Mar. 30, 1983, 58-52670; May 19, 1983, 58-86538

Int. Cl.⁴ B23K *11/08*

U.S. Cl. 219—64 **9 Claims**



1. An apparatus for producing welded metallic can bodies by welding unwelded metallic can bodies made of a surface treated steel plate and each having an overlapped portion by using a mash seam welding technique at the overlapped portions, said apparatus comprising:

an elongate electrode having an electrode surface of a shape corresponding to the shape of the overlapped portion of each can body;

two revolving electrodes having rotating shafts with said shafts being spaced along said elongate electrode parallel to said elongate electrode said revolving electrodes being opposed to said elongated electrode to revolve on the overlapped portions of two can bodies when the can bodies are disposed on the electrode surface of the elongate electrode;

electrical insulating means electrically insulating said revolving electrodes from each other;

means for placing the two unwelded can bodies on the electrode surface of the elongate electrode with the can bodies spaced from each other and the distance between the corresponding ends of the two can bodies equal to the spacing of the rotating shafts of said revolving electrodes;

means for moving said two revolving electrodes synchronously along the overlapped portions of the can bodies while they revolve on the overlapped portions;

means connected to said revolving electrodes for pressing them against the overlapped portions of the can bodies; and

feeder means for electrically coupling said two revolving electrodes across an alternating current power supply, whereby when the two revolving electrodes are revolving on the overlapped portions of the two can bodies, one terminal of the alternating current power supply is electrically coupled to the other terminal of the alternating current power supply only through the feeder means, one of said revolving electrodes, the overlapped portion of one can body, said elongate electrode, the overlapped

portion of the other can body, the other revolving electrode and said feeder means.

4,559,432

WIRE EDM FOR DETECTING DISCHARGE CONCENTRATIONS USING INDUCTANCE

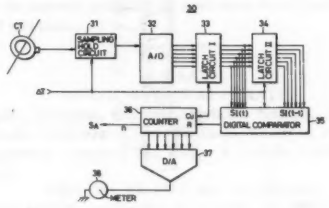
Tetsuroh Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,642

Claims priority, application Japan, Aug. 2, 1982, 57-134920; Aug. 10, 1982, 57-138947; Aug. 10, 1982, 57-138948

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219—69 W **14 Claims**



1. A wire cutting type electric discharge machine, comprising:

(1) a wire electrode for passing through a conductive workpiece;

(2) an operating power supply for applying a pulse-like voltage across a gap between said wire electrode and said workpiece to cause a discharge across said gap at a discharge position;

(3) interpole current detecting means for detecting the location of discharge positions along said gap at different times across said wire electrode and said workpiece by means of a current waveform as a function of the inductance at the discharge point of said wire electrode; and

(4) discharge concentration detecting means responsive to said interpole current detecting means for detecting a concentration of said discharge positions when a plurality of discharges occur at substantially the same point.

4,559,433

WIRE CUT ELECTRICAL DISCHARGE MACHINING APPARATUS WITH ELECTRIC FEEDERS IN A TUBULAR GUIDE

Jun Aramaki, and Masaru Shinkai, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00157, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04205, PCT Pub. Date Dec. 8, 1983

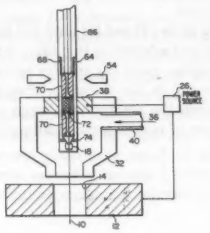
PCT Filed May 25, 1983, Ser. No. 588,863

Claims priority, application Japan, May 25, 1982, 57-88305

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219—69 W **11 Claims**

11. A wire cut electrical discharge machining apparatus comprising a tubular guide having an axial bore through which an electrode wire supplied from a wire supply reel extends, said tubular guide being provided in its sidewall with an inlet for a working fluid leading to said axial bore, an insulating pipe which is threadedly connected to said tubular guide, and through which said wire extends, a system connected to said pipe for moving said tubular guide vertically relative to an initial hole in the conductive material to be machined, an upper guide die provided at the lower end of said tubular guide below said inlet for supporting said wire, a lower guide facing said upper guide die and provided below said conductive material for guiding said wire, a wire cutter operable to cut said wire when said tubular guide is raised to a cutting position, a plurality of feeders disposed in said tubular guide for supplying electricity to said wire, a wire holder provided in said tubular guide and having an axial hole extending eccentrically relative to said axial bore of said tubular guide to hold said wire



in contact with said feeders, and an upper nozzle having a bearing by which said tubular guide is guided when it is vertically moved through said nozzle.

4,559,434

WIRE-CUT ELECTRIC DISCHARGE MACHINING METHOD USING STORED MACHINING INSTRUCTIONS

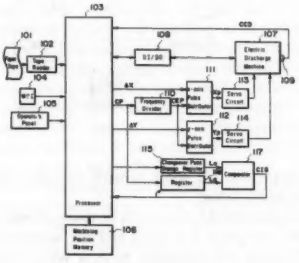
Mitsuo Kinoshita, Hachioji, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

Filed Dec. 14, 1982, Ser. No. 449,666

Claims priority, application Japan, Dec. 17, 1981, 56-204175

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219—69 M **12 Claims**



1. A wire-cut electric discharge machining method, using a control device with a data memory, for machining a workpiece in accordance with a command from the control device by moving a wire electrode relative to the workpiece along a commanded path and producing an electric discharge in a gap between the wire electrode and the workpiece, said method comprising the steps of:

(a) storing, in advance, sets of different machining conditions in the data memory of the control device;

(b) reading a machining condition selection instruction, specifying a final set of machining conditions, and a move command, specifying a traveling distance, from a machining program at the time that the workpiece is to be machined;

(c) selecting a first set of machining conditions from the sets of machining conditions in response to a previously read machining condition selection instruction and performing electric discharge machining based on the first set of machining conditions as a current set of machining conditions for a first portion of the traveling distance;

(d) selecting a second set of machining conditions, different from the current set of machining conditions, the second set of machining conditions being adjacent to the current

set of machining conditions and closer to the final set of machining conditions than the current set;

(e) performing electric discharge machining based on the second set of machining conditions as the current set of machining conditions for a second portion of the traveling distance; and

(f) repeating steps (d) and (e) until the second set of machining conditions selected in step (d) is the final set of machining conditions, steps (d) and (e) being repeated at a rate which results in the traveling distance being fully traversed when the electric discharge machining based on the final set of machining conditions is completed.

4,559,435

SPARK-EROSIVE PLANETARY ERODING APPARATUS WITH VARIABLE FLOW RATE OF DIELECTRIC FLUID

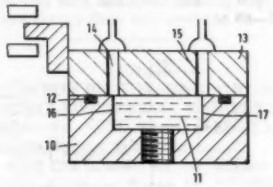
Peter Gosger, Solingen, Fed. Rep. of Germany, assignor to AEG Elotherm, GmbH, Remscheid, Fed. Rep. of Germany

Continuation of Ser. No. 462,075, Jan. 28, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 676,596

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202640

Int. Cl.⁴ B23P *1/08*

U.S. Cl. 219—69 D **1 Claim**



1. An apparatus for spark-erosive planetary eroding of a workpiece comprising:

an eroding electrode adapted to be lowered into a workpiece as the workpiece is eroded and the workpiece and electrode carry out planetary motion with respect to each other so that the width of an operating gap between the periphery of the electrode and the workpiece varies around the periphery of the electrode during said planetary motion;

a plurality of injection nozzles positioned around said gap for supplying liquid dielectric thereto; and

means for controlling flow of said dielectric to said nozzles in accordance with said planetary movement; wherein

said workpiece moves with respect to said electrode and said controlling means is mechanically coupled to said workpiece for movement with said workpiece; and

said controlling means includes an element having a chamber therein for receiving said liquid dielectric, a plate closing said chamber and having a plurality of bores, each corresponding to one of said nozzles, extending therethrough to communicate with said chamber and supply said liquid dielectric to one of said nozzles, said bores each terminating at a wall of said chamber to define an opening between said chamber and said bore, and means for rotating said plate in accordance with said planetary motion and with respect to said chamber so that said openings are varied in size in accordance with said planetary motion to accordingly vary the supply of said liquid dielectric to said injection nozzles.

4,559,436

HEAT EXCHANGER TUBE REPAIR

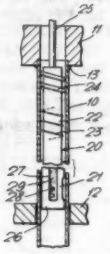
Peter F. Roach, Warrington; Edward Duncombe, Altrincham, and Ian Hulse, Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 4, 1984, Ser. No. 596,720

Claims priority, application United Kingdom, Apr. 13, 1983, 8309988

Int. Cl.⁴ B23K *1/20*

U.S. Cl. 219—85 M **4 Claims**



1. A method for the repair of a heat exchanger tube in a nest of tubes welded to a tube plate which tube is leaking where it is welded to said tube plate and which tube is either of U-tube shape or passes through one or more support grid plates, said method involving the known step of inserting a length of repair tube into the leaking tube with the inserted end of the repair tube brazed to the leaking tube and the other end of the repair tube explosively welded to the tube plate, characterized in that compressional strain in the leaking tube is measured whilst heating the tube to the brazing temperature and the brazing is only effected if the strain is below a predetermined level.

4,559,437

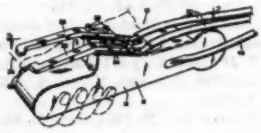
AIR ASSISTED HAND HELD WELDING TOOL

Joseph W. Griffith, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 4, 1984, Ser. No. 646,882

Int. Cl.⁴ B23K *11/10, 11/28*

U.S. Cl. 219—86.21 **11 Claims**



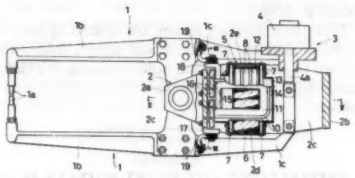
1. A hand welding tool comprising; first and second members each having a front end and rear end, an electrode finger carried by each of said first and second members at the front ends thereof, pivotal connecting means pivotally interconnecting said first and second members spaced inwardly from said

front end for relative pivoting of the front ends to pivot the electrode fingers toward and away from each other, and the improvement which comprises; first and second air passages in one of said members and coupling means for coupling the first air passage to an air pressure source, an expansion chamber formed between said members whereby expansion and deflation of the chamber urges pivoting of the members, means communicating said second air passages with said chamber, said first member having an air channel opening to the atmosphere and to the first and second passages, and a valve in said channel having a first position interconnecting the second passage to the atmosphere while sealing off the first passage, and a second position interconnecting the first and second passages while closing off the outlet to the atmosphere, and means for manual actuation of said valve from the first to the second positions.

4,559,438
WELDING GUN APPARATUS

Toshihiko Nakadate, Sayama; Morikuni Numata, Ageo; Akio Hamada, Tokorozawa, and Gen Tsujii, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,526
Claims priority, application Japan, Dec. 24, 1982, 57-225922; Jan. 21, 1983, 58-7409
Int. Cl.⁴ B23K *11/10*
U.S. Cl. 219—90 **3 Claims**



1. A welding gun apparatus having a gun bracket, a pair of gun arms pivotally mounted on said bracket, each having a rear end, a transformer mounted on said bracket, and a pressure applying mechanism on said bracket for opening and closing said gun arms; characterized in that said gun bracket comprises a frame which extends longitudinally from a front pivot portion for pivotally supporting said gun arms to a rear portion, said frame having a pair of right and left lateral side panels interconnected at said front pivot portion, said rear portion having a rear end panel interconnected between said pair of lateral side panels, said transformer being positioned in said frame between said front pivot portion, said rear portion and said side panels and being fixed to said front pivot portion.

4,559,439
FIELD CONVERTIBLE PLASMA GENERATOR AND ITS METHOD OF OPERATION

Salvador L. Camacho, and David P. Camacho, both of Raleigh, N.C., assignors to Plasma Energy Corporation, Raleigh, N.C.

Continuation-in-part of Ser. No. 460,062, Jan. 21, 1983. This application Dec. 2, 1983, Ser. No. 557,217
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—121 PM **11 Claims**

1. A plasma arc torch characterized by the ability to be configured for operation in the transfer arc mode or the non-transfer arc mode, and comprising

a tubular rear housing section,

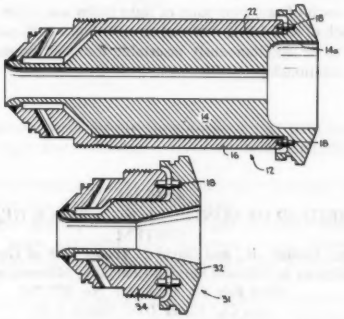
a cylindrical rear electrode mounted coaxially to said rear housing section and comprising a tubular metal member having a closed inner end and an open outer end,

annular vortex generating means mounted coaxially to said rear housing section and adjacent said outer end of said rear electrode for generating a vortical flow of a gas,

releasable mounting means fixedly mounted to said rear housing section,

an electrode assembly having a tubular bore therethrough and including means for releasably engaging said mounting means to releasably mount said electrode assembly to said rear housing section in an operative position in coaxial alignment with said rear electrode and said vortex generating means, and such that the bore of said electrode assembly is adapted to serve as an attachment point for an electrical arc extending from said rear electrode and through said vortex generating means to said bore, and

a collimating nozzle assembly having a tubular bore therethrough and including means for releasably engaging said



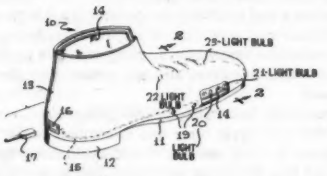
mounting means to releasably mount said collimating nozzle assembly to said rear housing section in an operative position in coaxial alignment with said rear electrode and said vortex generating means, and such that said collimating nozzle assembly is adapted to serve as a collimating nozzle for an electrical arc extending from said rear electrode and through said vortex generating means and through said bore of said collimating nozzle assembly to an external attachment point, and

whereby either said electrode assembly or said collimating nozzle assembly may be mounted by means of said mounting means to said rear housing section so that the torch may operate in a non-transfer arc mode when the electrode assembly is mounted to said rear housing section or in the transfer arc mode when said collimating nozzle assembly is mounted to said rear housing section.

4,559,440
BOOT DRYING DEVICE

Kenneth B. Hamasaka, 1239 E. Maple Ave., Glendale, Calif. 91205

Filed May 29, 1984, Ser. No. 614,514
Int. Cl.⁴ H05B *1/00*
U.S. Cl. 219—215 **1 Claim**



1. In a footwear drying device for simultaneously drying a pair of shoes comprising:

a common electric cable having at least two pairs of lead wires extending therethrough;

at least one light bulb operably coupled on an end of each of said pairs of leads;

mean including a power source connected to an opposite end of said cable from the ends coupled to said bulbs;

a cage carried on each of said leads disposed around each of said light bulbs in close proximity to said bulbs so as to allow insertion into and disposition within a toe area of each of said shoes in said pair;

said power source includes a battery and switch connected in series to said light bulbs via said cable;

each pair of said two pairs of lead wires are connected together by a separate strip disposing said bulbs of each pair in substantially fixed spaced apart relationship;

a fabric sleeve of wide mesh material removably covering each of said two pairs of light bulbs and leads; and

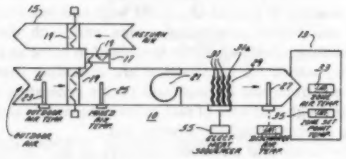
each of said fabric material covered light bulb pairs adapted to be simultaneously insertable into said boots in spaced relationship.

4,559,441

METHOD OF CONTROLLING A SPACE HEATING SYSTEM

George Rudich, Jr., and David L. Troup, both of Goshen, Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 13, 1984, Ser. No. 579,769
Int. Cl.[4] F24H *3/00*; H05B *1/00*
U.S. Cl. 219—364 **5 Claims**



1. A method of controlling a space heating system having a first controlled resistance heater adapted for modulated control by intermittent energization, and a plurality of second resistance heaters, said method including the steps of:

selecting a total bit count representative of the entire heating capacity of said heating system;

generating a signal representative of a set point temperature to be maintained within a space;

generating a signal representative of the actual temperature within said space;

computing the aggregate number of said resistance heaters required to be energized to raise said actual temperature to a value equivalent to said set point temperature, said aggregate number including a fractional component;

resolving said fractional component to a first bit count representative of a portion of a cycle time during which said controlled heater is to be energized, said cycle time being at least one second and not greater than thirty seconds, said;

repetitively, intermittently energizing said controller heater over said cycle time, said controlled heater being energized for that portion of said cycle time represented by said first bit count, said controlled heater being de-energized for that portion of said cycle time represented by the difference between said total bit count and said first bit count.

4,559,442

TOWEL WARMER AND HOLDER

Joe Graham, Milo, Iowa 50106

Filed Jun. 2, 1983, Ser. No. 500,524
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—385 **1 Claim**

1. A device for warming and holding towels comprising in combination:

a single, solid vertical support means, attached thereto, by bonding means, a single hollow vertical support means;

attached to the hollow vertical support means, by bonding means, a plurality of horizontal, spaced apart holding means;

contained within the hollow vertical support means, a heating means for the purpose of heating the hollow vertical support means and the plurality of horizontal spaced apart holding means;

the horizontal holding means are spaced apart a sufficient vertical distance to receive and store a folded towel;

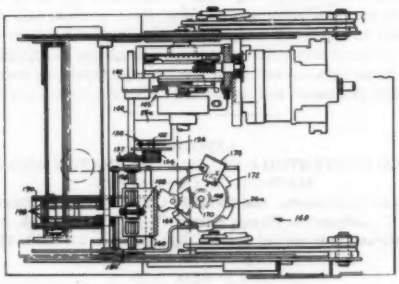
attached to each horizontal holding means is a flap, of sufficient size to reach the next lower horizontal holding means.

4,559,443

INITIALIZING THE PRINT WHEELS IN AN ELECTRONIC POSTAGE METER

Alton B. Eckert, Norwalk, Conn., and Easwaran C. N. Nambudiri, Hicksville, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 447,913, Dec. 8, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,027
Int. Cl.[4] G07G *1/00*
U.S. Cl. 235—101 **32 Claims**



1. A method for initializing the print wheels of an electronic postage meter, comprising the steps of:

placing a lever of a print wheel selection mechanism in its select position;

moving a carriage of the print wheel selection mechanism into abutment with a stop a plurality of times;

aligning the carriage with a plurality of racks of the selection mechanism;

orienting one of the plurality of racks with a predetermined one of the print wheels;
rotating the print wheel to the limit of its movement a plurality of times;
aligning the print wheel;
exercising the print wheel to set it at a predetermined position;
continuing the moving, aligning, orienting, and exercising steps sequentially with each print wheel to set all the print wheels to a predetermined position; and
outputting a signal when the foregoing steps have all been accomplished.

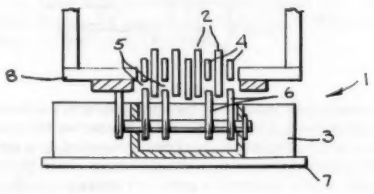
15. Apparatus for initializing the print wheels of an electronic postage meter, comprising:
print wheel selection means including an integral carriage assembly and a plurality of rack members;
means for placing the print wheel selection means in its select position;
means for moving the carriage assembly into abutment with a stop a plurality of times;
means for aligning the carriage assembly with the plurality of racks;
means for orienting the first rack with a predetermined one of the print wheels;
means for moving a print wheel the limit of its movement a plurality of times;
means for aligning the print wheel;
means for exercising the print wheel to set it at a predetermined position;
the moving means, aligning means, orienting means and exercising means sequentially acting upon the remaining print wheels to set all the print wheels to a predetermined position; and
means for outputting a signal when all the print wheels have been initialized to a predetermined position.

4,559,444

POSTAGE METER

Timothy R. Erwin, West Redding, and Robert E. Manna, Newtown, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 14, 1985, Ser. No. 701,717
Int. Cl.⁴ G07G *1/00*
U.S. Cl. 235—101 **11 Claims**



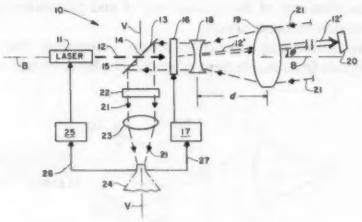
1. A postage meter having in a non-cycling position a flat bed printing mechanism comprising a print wheel having a plurality of wheel segments, an inker assembly, a letter guide means, and at least one protector arm, said print wheel segments having interposed therebetween rectifiers having smaller vertical dimensions than said print wheel segments, forming thereby a gap between said segments, said letter guide block in adjacent and vertical spaced relationship to said print wheel and separated therefrom by a space, said protector arm extending upwardly into said gap and through said space to form thereby a blocking means to any workpiece contact with said print wheel.

4,559,445

WIDE ANGLE OPTICAL TRANSMITTER/RECEIVER

Raymond C. Hedin, Apple Valley, and Fred G. Hewitt, Eagan, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 4, 1983, Ser. No. 538,879
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—203 R **5 Claims**



1. An optical system for directing a transmitted light beam toward a target and receiving a reflected beam therefrom, comprising:
a. a source of radiation providing a coherent collimated light beam directed along a first optical axis;
b. a scraper mirror, magneto-optic light deflector means, optical beam expander, and collimating lens disposed along said first optical axis intermediate said source and target;
c. said scraper mirror having a central hole concentric with said first optical axis for transmission of said light beam toward said deflector means, beam expander, lens and target, said mirror being inclined relative to said first optical axis to reflect said reflected beam along a second optical axis intersecting said first optical axis at said hole;
d. said deflector means comprising a thin ferromagnetic film having a plurality of parallel stripe domains therein forming a light diffraction grating, said deflector means being responsive to an applied magnetic field for controllably deflecting said light beam off said first optical axis in the direction of said target;
e. said optical beam expander disposed near said deflector means for expanding said deflected light beam to a predetermined beam size;
f. said collimating lens disposed in predetermined spaced relationship to said beam expander for collimating said expanded light beam, transmitting said beam in the direction of said target, and receiving said reflected beam from said target;
g. said beam expander and deflector means deflecting said return beam along said first optical axis to said scraper mirror; and
h. detector means, disposed along said optical second axis for detecting said reflected beam.

4,559,446

FOCUS DETECTING SYSTEM USING LIGHT FROM AN IMAGING OPTICAL SYSTEM FOR FOCUS DETECTION

Kenji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

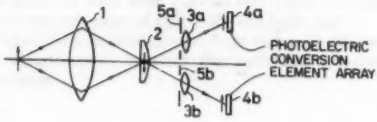
Filed Feb. 7, 1983, Ser. No. 464,578
Claims priority, application Japan, Feb. 18, 1982, 57-23615; Dec. 11, 1982, 57-217468
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—204 **13 Claims**

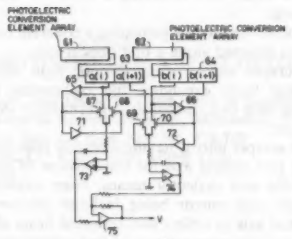
11. A focus detecting system comprising:
an imaging optical system having an exit pupil;
an auxiliary optical system disposed rearwardly of said imaging optical system, said auxiliary optical system forming a plurality of intensity distributions regarding an object by

light beams passed through a plurality of different portions of the exit pupil of said imaging optical system;

photoelectric conversion element arrays each comprising a plurality of elements and disposed at locations whereat said plurality of intensity distributions are formed, said photoelectric conversion element arrays putting out electrical signals corresponding to the distribution states of said intensity distributions, each of the elements of the first one of said photoelectric conversion element arrays having a predetermined correspondence relation with each of the elements of the second one of said photoelectric conversion element arrays;

signal processing operation means comparing the output signals from an element of said first photoelectric conversion element array and from an element of said second photoelectric conversion element array which are in said predetermined correspondence relation, extracting one of the minimum and maximum of said output signals, extracting the same with respect to all elements which are in said predetermined correspondence relation and obtaining an integrated signal value A, said signal processing operation means successively varying the predetermined correspondence relation between said first and second photoelectric conversion element arrays and obtaining a signal value group B of the signal value A of a number corresponding to the number of variations; and





focusing state discriminating means for calculating the amount of defocus of said imaging optical system by the use of said signal value group B.

4,559,447

TRANSLATION/ROTATION POSITIONING DEVICE

Nicholas E. Schlotter, Stanford, and John F. Rabolt, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

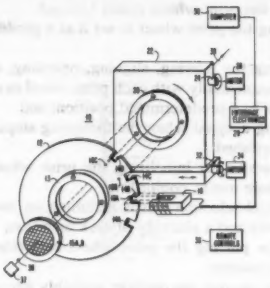
Filed May 16, 1983, Ser. No. 495,014
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 SE **5 Claims**

1. A translation/rotation positioning device comprising

a rotatable member with a rotation axis and having a plurality of position identifying circumferentially spaced openings therein, said member having an aperture for the transmission of a light beam,

means alignable with said openings for optically reading the presence or absence of openings,

means for rotating the member to discrete positions, and



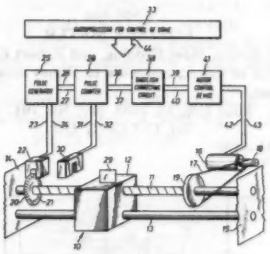
means concurrently operable for moving the member translationally in a direction at right angles to the axis of rotation of said member.

4,559,448

METHOD AND DEVICE FOR MEASURING BACKLASH IN A DRIVE MECHANISM COMPRISING A SCREW AND A NUT

Kalman Rozsa, Järfälla, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

PCT No. PCT/SE82/00177, § 371 Date Feb. 15, 1983, § 102(e) Date Feb. 15, 1983, PCT Pub. No. WO82/04477, PCT Pub. Date Dec. 23, 1982
PCT Filed May 17, 1982, Ser. No. 466,652
Claims priority, application Sweden, Jun. 18, 1981, 8103841
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 SE **8 Claims**



1. A method for measuring backlash arising in a drive mechanism comprising a screw (11) and a nut device co-operating with the screw, the nut device being connected to a movable unit (12) displaceable in opposite directions along the screw, preferably a printing unit of a printer or a typewriter, the drive mechanism comprising a pulse generating means (20,22,25), the number of emitted pulses of which for each displacement corresponding to the distance run, and a pulse counting means (28) being provided for counting of the pulses emitted by the pulse generating means, said method comprising moving the movable unit (12) away from an end position adjacent one end of the screw, resetting of the pulse counting means (28) during the continued movement of the movable unit, maintaining the movement a distance beyond the position in which the pulse counting means was reset that is greater than the greatest possible value of the backlash, stopping the drive mechanism, moving the movable unit (12) in the reversed direction towards the end position during which movement the pulse counting means (28) counts backwards, and stopping the pulse counting

means in a position in which the pulse counting means was reset, wherein the absolute value remaining in the pulse counting means (28) will be a measure of the backlash.

4,559,449

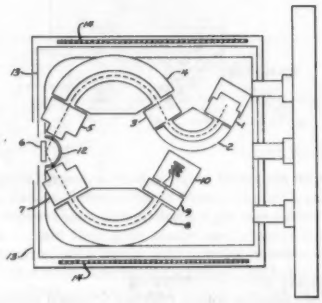
HIGH RESOLUTION PARTICLE SPECTROMETER

Lawrence L. Kesmodel, Bloomington, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed May 23, 1984, Ser. No. 613,151

Int. Cl.[4] H01J *49/48, 40/00*

U.S. Cl. 250—305 **5 Claims**



1. A high-resolution particle energy loss spectrometer device comprising:

a. source means for producing a focused and collimated beam of particles;

b. first stage monochromator mean for selecting particles within a specified energy range exiting from the source means;

c. intermediate particle lens means for both in-plane and out-of-plane focussing for collimating, accelerating and decelerating the particles exiting the first stage monochromator means;

d. second stage monochromator means for selecting particles within a specified energy range from particles exiting the intermediate particle lens means;

e. exit lens means for focusing selected particles onto a sample;

f. input lens means for focusing particles deflected from the sample;

g. analyzer means for selecting particles within a specified energy range from particles exiting the input lens; and

h. detector means for detecting particles exiting the analyzer means and impinging thereon.

4,559,450

QUANTITATIVE COMPOSITIONAL ANALYSER FOR USE WITH SCANNING ELECTRON MICROSCOPES

Vivian N. E. Robinson, Oyster Bay, and Nicholas G. Cutmore, Randwick, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Aug. 1, 1983, Ser. No. 519,056

Claims priority, application Australia, Aug. 6, 1982, PF5247

Int. Cl.[4] G01N *23/225*

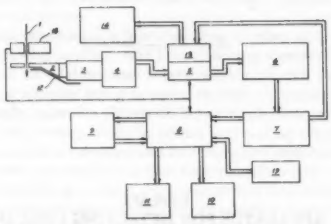
U.S. Cl. 250—310 **10 Claims**

1. An analysis sytem for determining the atomic number factor of a region of a specimen, system being adapted for connection to a scanning electron microscope or equivalent device for generating and controlling an electron beam which impinges on the region of the specimen, said system comprising a backscattered electron detector having an output indicative of the average energy of all electrons backscattered by said region, an amplifier connected to the output of said detector, a processing circuit to receive the output of said amplifier, an analog to digital converter connected to the output of said amplifier, a multi-channel analyser connected to the output of said digital to analog converter, and said processing circuit comprises a digital conversion and processing circuit connected to the output of said multi-channel analyser, the output of the processing circuit being in accordance with the relationship

$$S = K \cdot \eta \cdot F(Z)$$

where

S is the amplified output of the backscattered electron detector,



K is a constant determined by the operational conditions of the scanning electron microscope or equivalent device,

η is the fraction of electrons backscattered by said region, and

F(Z) is the difference between the backscattered electron yield curve for materials of known atomic number factor and the amplified backscattered electron detector output signal curve for the same materials of known atomic number factor, to thereby indicate the atomic number factor of said region, and means to display and/or record the output of said processing circuit.

4,559,451

APPARATUS FOR DETERMINING WITH HIGH RESOLUTION THE POSITION OF EDGES OF A WEB

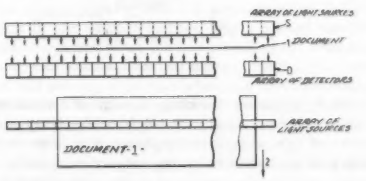
Barry J. Curl, Southampton, England, assignor to De La Rue Systems Limited, Portsmouth, England

Filed Nov. 10, 1982, Ser. No. 440,588

Claims priority, application United Kingdom, Nov. 13, 1981, 8134266

Int. Cl.[4] G01B *11/04;* G01N *21/00*

U.S. Cl. 250—560 **13 Claims**



1. An apparatus for scanning a surface of a sheet like member to determine the position of edges of the member, said apparatus comprising:

a sensor array consisting of a plurality of photoelectric sensors arranged transversely across the surface to receive light from a corresponding plurality of elemental areas across a transverse strip of the surface,

conveyor means for providing relative longitudinal movement of the member with respect to the sensor array, allowing the sensor array to scan the member longitudinally, and

a processing circuit for determining the relationships between the signal from each sensor, representing the inten-

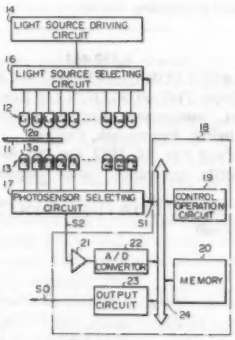
sity of received light, and at least three predetermined threshold values of intensity and, in accordance with said relationships, for determining the transverse position of a discontinuity in the amount of light received from the elemental areas across the strip, corresponding to an edge of the member, to a greater resolution than would be possible using only one threshold value of intensity for each sensor.

4,559,452

APPARATUS FOR DETECTING EDGE OF SEMITRANSPARENT PLANE SUBSTANCE

Seigo Igaki, Inagi; Tadao Nakakuki, Tokyo; Takefumi Inagaki; Shuetsu Oikawa, both of Kawasaki, and Takashi Fujimura, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,726
Claims priority, application Japan, Jun. 2, 1982, 57-093046; Jul. 14, 1982, 57-121292; Mar. 26, 1983, 58-050642
Int. Cl.⁴ G01N *21/86*
U.S. Cl. 250—560 **10 Claims**



1. An apparatus for detecting an edge of a semitransparent plane substance provided with a light source array including a plurality of light sources and a photosensor array including a plurality of photosensors having outputs, comprising:

means, operatively connected to the light source array and said photosensor array, for selecting a light source and photosensor pair and for providing a selection signal;

means, operatively connected to said selecting means, for driving the selected light source and photosensor pair; and

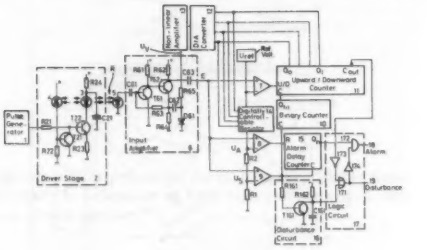
means, operatively connected to said photosensor array, for comparing the outputs of each of the plurality of photosensors, when the semitransparent plane substance between the light source array and the photosensor array is not detected, with the corresponding outputs of each of the plurality of photosensors when the semitransparent plane substance between the light source array and the photosensor array is detected, thereby detecting the edge portion of the semitransparent plane substance.

4,559,453

SMOKE DETECTOR WITH A RADIATION SOURCE OPERATED IN A PULSE-LIKE OR INTERMITTENT MODE

Jürg Muggli, and Martin Labhart, both of Männedorf, Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed May 5, 1983, Ser. No. 491,707
Claims priority, application Switzerland, May 13, 1982, 2973/82
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 250—565 **26 Claims**



1. A smoke detector comprising:

a pulsed radiation source emitting focussed radiation pulses into a region freely accessible to environmental air;

a radiation receiver arranged at a predetermined variable distance from said radiation source in the path of said radiation pulses and generating a pulse output signal under the action of said radiation pulses;

an input amplifier series connected to said radiation receiver;

said input amplifier generating output pulses of a voltage essentially proportional to the intensity of said radiation pulses impinging upon said radiation receiver;

an evaluation circuit comprising:

a reference voltage generator for generating a reference voltage for comparison with said voltage of said output pulses generated by said input amplifier;

an alarm stage defining an alarm threshold relative to said reference voltage and comparing said voltage of said output pulses generated by said input amplifier with said alarm threshold;

said alarm stage triggering an alarm signal indicative of the presence of smoke in said path of said radiation pulses, when said output pulses generated by said input amplifier have been attenuated below said alarm threshold for more than a first predetermined period of time;

a disturbance circuit defining a disturbance threshold relative to said reference voltage and lower than said alarm threshold;

said disturbance circuit triggering a disturbance signal indicative of the presence of a disturbance other than smoke in said path of said radiation pulses, when said output pulses generated by said input amplifier have been attenuated below said disturbance threshold within a second predetermined period of time shorter than said first predetermined period of time associated with said alarm stage;

adjusting means for comparing said voltage of said output pulses generated by said input amplifier and said reference voltage and, in the case of a difference therebetween, adjusting relative to each other said voltage of said output pulses and said reference voltage at a rate corresponding to a time constant greater than one minute and within a third time period longer than said first and second predetermined periods of time, such that said difference between said voltage of said output pulses and said reference voltage is maintained at a value of substantially zero; and

a device for varying the ratio of said alarm threshold to said reference voltage as a function of said predetermined

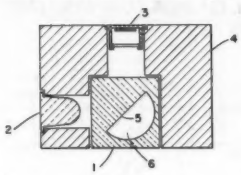
variable distance between said radiation source and said radiation receiver.

4,559,454

BUBBLE DETECTING INFUSION APPARATUS

Donald L. Kramer, P.O. Box 606, Wakarusa, Ind. 46573

Filed Apr. 1, 1983, Ser. No. 481,500
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—577 **6 Claims**



1. An infusion apparatus having liquid flow path means for conducting a flowing infusion liquid from a source thereof to a patient, the improvement comprising a light transmissive conduit member in said flow path means and adapted for flow therethrough of infusion liquid, said conduit member having external shoulder means and having a lumen which is generally semicircular in transverse cross section to provide a flat generally diametrical lumen wall surface portion therein; a yoke in which said conduit member is removably disposed in operative position, said yoke having positioning shoulder means cooperable with the external shoulder means on said conduit member when the latter is in said operative position to prevent rotation of said conduit member relative to said yoke, said yoke also having a light source for directing a light beam through said conduit member wall toward said flat lumen wall surface portion when said conduit member is in said operative position, said yoke also having a light sensor positioned to receive light from said source reflected by said flat lumen wall surface portion through said conduit member wall when said conduit member is in said operative position, said yoke, when said conduit member is in said operative position therein, positioning said light source and light sensor with respect to said flat lumen wall surface portion at an angularity such that when liquid flowing through the conduit member is bubble-free, said surface is not substantially reflective, whereas when a bubble is entrained in the liquid flowing through said conduit member and contacts said flat lumen wall surface portion, substantially all of the light from said source incident upon said flat lumen wall surface portion is reflected by said wall surface portion through said conduit member wall toward said sensor, wherefore sensing of substantial light by the sensor indicates the presence of a bubble in the infusion liquid flowing through said conduit member.

4,559,455

ACCESSORY CARRYING TYPE STARTING MOTOR

Toshinori Tanaka, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,879
Claims priority, application Japan, Jan. 8, 1983, 58-1563[U]
Int. Cl.[4] H02K *7/10*
U.S. Cl. 290—38 R **1 Claim**

1. An accessory carrying type starting motor assembly for a vehicle comprising an engine, a crank shaft operatively connected to the engine, a ring gear secured to the crank shaft, a battery, and a key switch in series with the battery, said assembly comprising:

(a) a frame;

(b) a d.c. motor mounted on said frame;

(c) a first rotary shaft operatively connected to said d.c. motor such that operation of said d.c. motor causes rotation of said first rotary shaft, said first rotary shaft being journaled for axial movement in said frame between a first position and a second position;

(d) a pinion and an overrunning clutch mounted on said first rotary shaft for rotation therewith and axial movement relative thereto, said pinion being axially movable relative to said first rotary shaft between a first position in which it meshes with the ring gear secured to the crank shaft of the engine of the vehicle and a second position in which it does not mesh with the ring gear;

(e) a pump for pumping a working fluid used to power accessory devices;

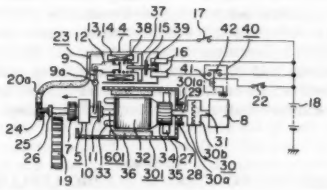
(f) a second rotary shaft operatively connected to said pump such that rotation of said second rotary shaft causes actuation of said pump;

(g) a clutch comprising a first clutching member and a second clutching member, said first clutching member being mounted on said second rotary shaft and said second clutching member being mounted on said first rotary shaft and axially movable therewith between the first position of said first rotary shaft, in which said second clutching member does not engage said first clutching member, and the second position of said first rotary shaft, in which said second clutching member does engage said first clutching member, transmitting the rotation of said first rotary shaft to said second rotary shaft and then to said pump;

(h) an electromagnetic switching device comprising:

(i) a coil;

(ii) a plunger movable relative to said coil between a first position which it assumes when the key switch of the vehicle is open and a second position which it assumes when the key switch of the vehicle is closed;



(iii) a first spring biasing said plunger towards its first position;

(iv) a stationary contact in series between the battery and said d.c. motor;

(v) a movable contact movable relative to said coil between a first position which it assumes when the key switch of the vehicle is open and a second position which it assumes when the key switch of the vehicle is closed, said movable contact being in electrical contact with said stationary contact when said movable contact is in its second position and not being in electrical contact with said stationary contact when said movable contact is in its first position; and

(vi) a second spring biasing said movable switch towards its first position;

(i) a pivotally mounted shift lever having a first end connected to said plunger and a second end connected to said pinion and said overrunning clutch such that motion of said plunger from its first position to its second position causes said pinion to move axially relative to said first rotary shaft from its second position to its first position and motion of said plunger from its second position to its first position causes said pinion to move axially relative to said first rotary shaft from its first position to its second position; and

(j) a pump switch for actuating said pump, said pump switch being in series between the battery of the vehicle and said stationary contact,

whereby:

(k) when the key switch of the vehicle is closed while said pump switch remains open,

(i) said movable contact is brought into electrical contact with said stationary contact, providing a closed circuit between the batery and said d.c. motor which causes said d.c. motor to begin rotating;

(ii) movement of said plunger from its first position to its second position causes said pinion to move axially relative to said first rotary shaft until said pinion meshes with the ring gear secured to the crank shaft of the engine, whereby rotation of said pinion caused by said d.c. motor can be used to start the engine; and

(iii) said first rotary shaft moves relative to said frame from its second position to its first position, whereby said second clutching member disengages from said first clutching member and the rotation of said first rotary shaft caused by said d.c. motor is not transmitted to said pump;

(l) when the key switch of the vehicle is subsequently opened while said pump switch remains open,

(i) said second spring moves said movable contact out of electrical contact with said stationary contact, breaking the circuit between the battery and said d.c. motor and causing said d.c. motor to stop rotating;

(ii) movement of said plunger from its second position to its first position causes said pinion to move relative to said first rotary shaft until said pinion moves out of engagement with the ring gear secured to the crank shaft of the engine; and

(iii) said first rotary shaft moves relative to said frame from its first position to its second position, whereby said second clutching member is brought into engagement with said first clutching member; and

(m) when said pump switch is subsequently closed while the key switch of the vehicle remains open, an electrical circuit between the battery and said d.c. motor is closed, causing said d.c. motor to begin rotating, and the rotational motion of said d.c. motor is transmitted through said first rotary shaft and said clutch to said pump.

4,559,456

BATTERY POWERED ELECTRIC APPLIANCE

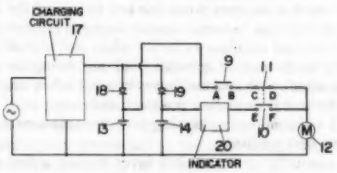
Shigeo Yamamoto; Makoto Tanimizu; Kenzo Shirakawa, and Hideji Wataya, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 18, 1984, Ser. No. 611,868

Claims priority, application Japan, Jun. 15, 1983, 58-106886

Int. Cl.⁴ H02J *9/06*

U.S. Cl. 307—66 **10 Claims**



1. A battery powered electric appliance comprising:

a main battery,

a reserve battery of less capacity than that of the main battery;

main switching means for connecting the main battery to a load to be driven thereby and disconnecting it therefrom;

subsidiary switching means for connecting the reserve battery to the load to be driven thereby and disconnecting it therefrom; and

locking means for holding the subsidiary switching means from connecting the reserve battery to the load until the main switching means is in operative position of connecting the main battery to the load.

4,559,457

SAMPLING CIRCUIT

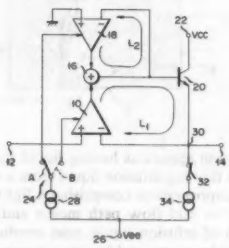
Tsutomu Sugawara, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 14, 1983, Ser. No. 504,311

Claims priority, application Japan, Jun. 28, 1982, 57-111216

Int. Cl.⁴ H03K *17/60*; **G11C** *27/02*

U.S. Cl. 307—352 **7 Claims**



1. A sampling circuit generally suitable for a sample-and-hold circuit and having an input terminal to which an electrical signal with an analog waveform is supplied and an output terminal, said sampling circuit comprising:

(a) a first differential amplifier having a noninverting input terminal connected to said sampling circuit input terminal, an inverting input terminal connected to said sampling circuit output terminal, and an output;

(b) a second differential amplifier having a noninverting input to which a predetermined reference voltage is supplied, an inverting input, and an output;

(c) adder means for adding output signals from said first and second differential amplifiers to generate a sum signal at an output thereof connected to the inverting input of said second differential amplifier;

(d) a transistor having a base connected to the output of said adder means, an emitter connected to the inverting input of said first differential amplifier and to said output terminal of said sampling circuit, and a collector to which a power source voltage is supplied; and

(e) controlling means, connected to said first and second differential amplifiers, for selectively supplying operating power to one of said first and second differential amplifiers, thereby selectively and alternately setting said first and second differential amplifiers in an operative state.

4,559,458

TEMPERATURE TRACKING AND SUPPLY VOLTAGE INDEPENDENT LINE DRIVER FOR ECL CIRCUITS

Bing-Fong Ma, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 6, 1984, Ser. No. 597,618

Int. Cl.⁴ H03K *19/086, 19/013, 17/14, 17/04*

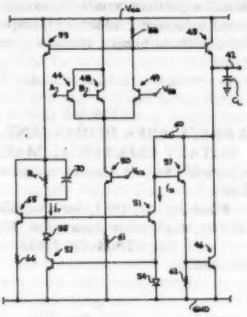
U.S. Cl. 307—455 **11 Claims**

1. A temperature tracking and supply voltage independent line driver for an ECL gate, comprising:

circuit means for detecting transitions on the output line of said ECL gate and generating a reference current in response to the detection of transitions in said ECL gate, said reference current reflecting the desired output on said ECL gate; and

Wilson current mirror means for mirroring said reference

current and for differential-to-single ended conversion, said mirrored current being applied to said line driver



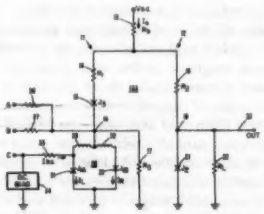
whereby the current drawn by said line driver is increased during high-to-low transitions.

4,559,459

HIGH GAIN NON-LINEAR THRESHOLD INPUT JOSEPHSON JUNCTION LOGIC CIRCUIT

Tsing-Chow Wang, Norristown, and Richard M. Josephs, Willow Grove, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,524
Int. Cl.⁴ H03K *19/195*
U.S. Cl. 307—462 **9 Claims**



1. A high gain non-linear threshold input logic circuit, comprising:

a supply current source,

a low reference voltage,

an output branch connected in series between said supply current source and said low reference voltage,

said output branch comprising an output branch resistor in series with an output Josephson junction device,

an input branch connected in series between said supply current source and said low reference voltage,

said input branch comprising a branch resistor, an input Josephson junction device and a sink resistor in series,

an input node between said input Josephson junction device and said sink resistor,

non-linear threshold input logic circuit means coupled to said input node of said input branch,

said non-linear threshold input logic circuit means comprising a plurality of input gate circuits coupled to said input node,

biasing means for applying a biasing current to said input node, and

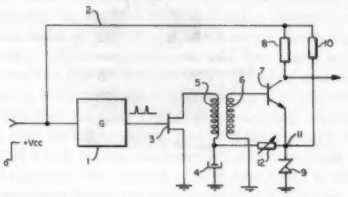
said non-linear threshold input logic circuit means being coupled to said input node and said biasing means for providing a non-linear input threshold characteristic.

4,559,460

TOTAL SECURITY TIME-DELAY CIRCUIT

Etienne Camus, Senlis, France, assignor to Jeumont-Schneider Corporation, France

Filed Mar. 28, 1983, Ser. No. 479,323
Claims priority, application France, Apr. 2, 1982, 82 05707
Int. Cl.⁴ H03K *19/007, 17/28*
U.S. Cl. 307—592 **4 Claims**



1. A total security time-delay circuit for providing a series of pulses after a specific minimum interval in response to a direct voltage applied to an input terminal of the circuit, comprising a transformer having a primary winding (5) and a secondary winding (6) connected to respective primary and secondary winding circuits, the primary winding circuit including a pulse generator (1) having an input connected to said input terminal, first switching means (3) having a control input connected to the output of said pulse generator and a pair of switch terminal series-connected between a first terminal of said primary winding and a point of reference potential, and a capacitor (4) connected between a second terminal of said primary winding and said point of reference potential, the secondary winding circuit including second switching means (7) having a control terminal and series-connected first and second switch terminals, said control terminal being connected to a first terminal of said secondary winding, with a second terminal of said secondary winding being connected to said point of reference potential, a first resistance (8) connected between said input of said pulse generator and said first switch terminal of said second switching means, a second resistance (10) connected between said input of said pulse generator and said second switch terminal of said second switching means, a third resistance connected between said second switch terminal of said second switching means and said second terminal of said primary winding, and a Zener diode (9) connected between said second switch terminal of said second switching means and said point of reference potential, whereby said series of pulses is provided at a point of connection of said first resistance to said first switch terminal of said second switching means.

4,559,461

STEPPING MOTOR

Akira Takahashi, Gyoda; Kenji Matsui, Konosu, and Hajime Suzuki, Kawasaki, all of Japan, assignors to Jeco Company Limited, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,641
Claims priority, application Japan, Jul. 19, 1983, 58-111982[U]
Int. Cl.⁴ H02K *37/00*
U.S. Cl. 310—49 R **4 Claims**

1. A stepping motor comprising:

a rotary shaft;

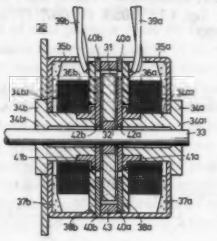
a rotor magnetized in an axial direction thereof and having a plurality of magnetic poles arranged in a circumferential direction thereof with different poles in alternation;

inner yokes each having a plurality of projections and depressions;

outer yokes each having a plurality of projections and depressions which are separated from and oppose the depressions and projections of the corresponding inner yoke in a plane perpendicular to said axial direction;

coils for magnetizing said inner and outer yokes to assume mutually different magnetic poles; and

a plurality of oil impregnated bearings supporting said rotary shaft, each of said bearings being made from a ferromagnetic material and including a portion constituting ferromagnetic core having an outer surface surrounded by a respective one of said coils for magnetic coupling therewith whereby said bearings serve the dual function of bearing support of said shaft and cores of said coils.

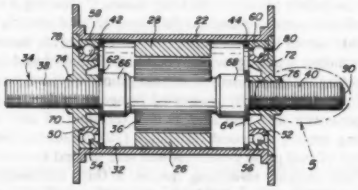


4,559,462

DYNAMO-ELECTRIC CYCLE AXLE

Wilfredo Hernández-Badillo, Cuesta Vieja #43, Aguadilla, P.R. 00603

Filed May 30, 1984, Ser. No. 615,468
Int. Cl.[4] H02K *7/08*
U.S. Cl. 310—67 A **4 Claims**



1. A dynamo-electric cycle axle for positioning within the hub of a wheel, comprising in combination:

(a) an elongated axle cylinder together with a multiplicity of curved permanent magnets longitudinally centered along the inner periphery of said axle cylinder thereby forming a generator rotor;

(b) a stator coaxially positioned within said axle cylinder, containing an induction coil set and two threaded axles on either side, wherein said rotor rotates relative to said stator thereby forming a voltage generator;

(c) means for conducting electrical energy from said induction coil set to a fixed contact and conductor;

(d) two ball bearing assemblies each constructed of a cylindrical inner cup, a multiplicity of ball bearings and a ball retainer, wherein one ball bearing assembly is coaxially placed on each of said axles;

(e) two circular rings selectively insertable into each end of said central cylinder at a desired depth to respectively limit the inward ingress of said ball bearing assemblies to a desired depth;

(f) lid nuts with inner threads which thread onto mating threads on said axles, wherein said lid nuts secure said ball bearing assemblies in place and wherein said lid nuts are stationary with respect to said axles and movable with respect to said ball bearing assemblies;

(g) adjustment nuts integral to said lid nuts and located axially on the outside surface of said lid nuts;

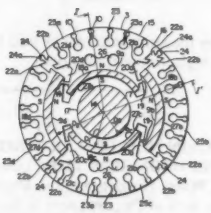
(h) two end cylinders placed laterally on either side of said induction set, and a washer disposed between each end cylinder and the adjustment lid nut, the outer diameters of said end cylinders and said washers being less than the inner diameter of said circular rings, whereby adjusting each of said adjustments nuts can axially shift said stator to center said induction coil set with respect to said magnets and also distribute biasing stresses upon said ball bearing assemblies.

4,559,463

LARGE SURFACE AREA PERMANENT MAGNET TYPE ROTARY ELECTRICAL MACHINE

Hideaki Kobayashi, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,246
Claims priority, application Japan, Jul. 27, 1983, 58-135980
Int. Cl.[4] H02K *21/12*
U.S. Cl. 310—156 **16 Claims**



1. A rotary electric machine, comprising:

a stator having a stator core;

a rotor having a rotor core coaxially disposed inside of said stator core, and a rotatable shaft; and

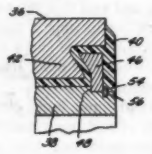
a plurality of pairs of arc-shaped permanent magnets disposed within said rotor core, to provide a plurality of adjacent magnetic poles, said permanent magnets being disposed symmetrically about the axis of said shaft, each of said pairs of magnets being concentric and at different distances from said axis, the ends of said permanent magnets forming said adjacent magnet poles overlapping each other at intervals viewed radially from said axis, said rotor core having increased reluctance zones between the ends of said permanent magnets forming said adjacent magnetic poles.

4,559,464

MOLDED COMMUTATOR AND METHOD OF MANUFACTURE

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,877
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—233 **3 Claims**



1. A commutator for rotating electrical machinery comprising:

an annular segment pack including a plurality of conductive segments having inner and outer surfaces, said segments being circumferentially arranged in a spaced-apart rela-

tionship about an axis so that their outer surfaces form an overall structure of cylindrical shape as the outer surface of the commutator, each said segment having a segment tang extending radially from the inner radius of said segment toward said axis, said segment tang being axially located intermediate the axial ends of said segment and extending axially for a substantial portion of the axial length of said segment, with said segment tang forming an integral part of said segment and being shaped so that the axial width of said segment tang is greatest at a radius located between the innermost radius of said segment tang and the outermost radius thereof;

an annular core located inside said annular segment pack;

means for mechanically interlocking each of said segments tangs with said core with the radially inner surfaces of said segments being spaced apart from the radially outer surface of said annular core; said interlocking means comprising a pair of core tangs associated with each said segment gang, with said core tangs being located at opposite axial ends of said segment tang, said core tangs extending radially from the outermost radius of said core toward said conductive segments and being shaped such that the axial width of each of said core tangs is greatest at a radius which is larger than the radius of the axially widest portion of said segment tang, and each pair of said core tangs being configured so that the axial distance between said core tangs at their axially widest portions is less than the width of the widest portion of the associated segment tang, so as to provide interlocking engagement between said segment tang and said core tangs, and means for attaching said core tangs to said core comprising a shoulder formed in said core for axially positioning at least one of said core tangs on said core and for restraining said core tang from axial movement in a direction toward the axial center of said core and means for restraining said core tangs from axial movement in a direction toward the axial end of said core, said means for restraining said core tang comprising a split ring and a circumferential groove in said core for engagement with said split ring.

4,559,465

BRUSH HOLDER ASSEMBLY FOR AN ELECTRIC MOTOR

Georges C. Gagneux, Chatellerault, France, assignor to Equipements Automobiles Marshall, Issy-Les-Moulineaux, France

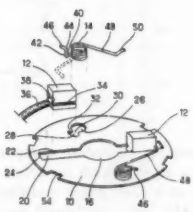
PCT No. PCT/FR83/00149, § 371 Date Mar. 22, 1984, § 102(e) Date Mar. 22, 1984, PCT Pub. No. WO84/00645, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 21, 1983, Ser. No. 601,620

Claims priority, application France, Jul. 22, 1982, 82 12826

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—242 **7 Claims**



1. A brush holder for an electric motor having a commutator, said brush holder comprising, a substantially flat plate having a generally central opening therein for receiving the motor commutator, first and second brush guiding slots formed in said plate, each of said slots opening into said central opening and extending outwardly of the central opening, each of said slots having generally parallel side edges; a first brush in said first slot and having oppositely opening grooves slidably mounting the first brush between the side edges of the first slot, a second brush in said second slot and having oppositely opening grooves slidably mounting the second brush between the side edges of the second slot; first and second brush spring receiving openings formed in said plate in spaced relation respectively to said first and second brush guiding slots; first and second torsion brush springs each comprising a body, an arm extending from one end of the body, and a retaining hook extending from the other end of the body; said brush springs being mounted on said plate with said bodies extending respectively into said first and second brush spring receiving openings; a notch communicating with said first brush spring receiving opening and defining a tab for engaging and retaining the retaining hook of the first brush spring, a notch communicating with said second brush spring receiving opening and defining a tab for engaging and retaining the retaining hook of the second brush spring, said arm of said first brush spring being engageable with an end of said first brush to urge the first brush inwardly toward the commutator and said arm of said second brush spring being engageable with an end of said second brush to urge said second brush inwardly toward the commutator, said first brush being movable outwardly in its slot to a retracted position in which said arm of said first brush spring engages a side face of the first brush to hold the first brush in said retracted position, and said second brush being movable outwardly in its slot to a retracted position in which said arm of said second brush spring engages a side face of the second brush to hold the second brush in said retracted position.

4,559,466

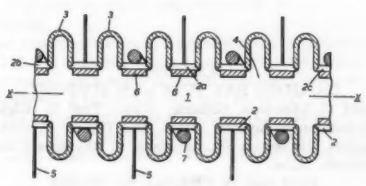
METAL VAPOR SEGMENTED DISCHARGE TUBES

Timothy P. Donaldson, Great Totham, England; Colin A. Pirrie, Alloa, and Arthur Maitland, St. Andrews, both of Scotland, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Dec. 20, 1983, Ser. No. 563,459

Int. Cl.⁴ H01J *1/02*; H01S *3/02*

U.S. Cl. 313—15 **17 Claims**



1. A metal vapour segemented discharge tube having an external envelope and comprising a plurality of tubular electrodes, each of said electrodes surrounding the path of a discharge through said tube, said electrodes being anodes and cathodes arranged alternately along the length of the tube, all of said electrodes forming respective parts of said external envelope and being so arranged that at least one of them may be subjected to a heating effect controlled from outside of the tube.

4,559,467

ION-GENERATOR FOR PRODUCING AN AIR FLOW

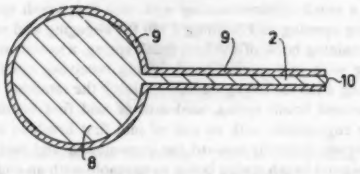
Friedrich K. Beckmann, Schenefeld; Horst Dötsch, Pinneberg, and Dieter Gossel, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,136

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148380

Int. Cl.[4] H05H *5/02*

U.S. Cl. 313—359.1 3 Claims



1. An ion-generator for producing an air flow, which comprises a plurality of rectangularly shaped plate electrodes spaced from one another and respectively lying in planes parallel to the direction of the air flow, said plate electrodes extending perpendicularly to the direction of the air flow, the edge of each plate electrode facing upstream being rounded; a plurality of rows of needle electrodes disposed upstream of the plate electrodes and extending perpendicularly to the direction of the air flow, said rows of needle electrodes being respectively associated with and oriented towards the gaps between the plate electrodes, the tips of all the needle electrodes being disposed in a plane perpendicular to the direction of the air flow; an electrically conductive rod-shaped support for each row of needle electrodes, said rod-shaped supports being arranged parallel to the rounded edges of the plate electrodes; an electrically insulating material covering each rod-shaped support and its associated row of needle electrodes except for the tip of each needle electrode; means to connect the plate electrodes to one terminal of a high-voltage d.c. source; and means to connect the rod-shaped supports to the other terminal of said d.c. source.

4,559,468

CATHODE RAY TUBE GUN SUPPORT

Raymond C. Morrison, Scituate, Mass.; Paul H. Gleichauf, deceased, late of Scituate, Mass., and Theresa C. Gleichauf, executrix, Pittsburgh, Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 25, 1982, Ser. No. 392,400

Int. Cl.[4] H01J *29/82*

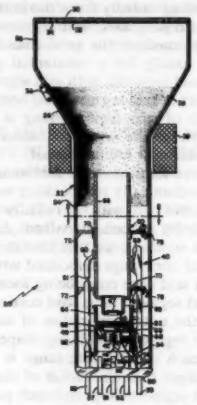
U.S. Cl. 313—456 12 Claims

1. An electron device comprising:

a support member;

an electrode spaced from said support member; and

an electrical conductor having respective securable portions secured to said support member and said electrode and having between said securable portions an integral hollow tubular portion including transverse yieldable means for supporting said electrode in spaced relationship with said support member axially of said tubular portion and for permitting transverse motion of one of said securable portions relative to the other one of said securable portions.



4,559,469

GREEN EMITTING PHOSPHOR AND CATHODE-RAY TUBE PROVIDED WITH SUCH A PHOSPHOR

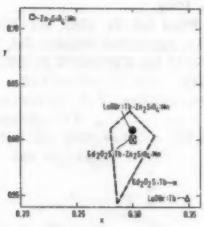
Thomas Welker, Monschau; Klaus Carl, and Wolfram Czarnojan, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 559,079, Dec. 7, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,145

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248448

Int. Cl.[4] H01J *29/20*

U.S. Cl. 313—468 3 Claims



1. A green emitting phosphor composition for heavily loaded cathode-ray tubes, which phosphor composition consists of a mixture of a deep green emitting phosphor of the formula Zn_2SiO_4:Mn and a yellowish-green emitting phosphor, of the formula XOZ:Tb in the following weight ratios:

Zn_2SiO_4:Mn:XOZ:Tb=4:6 to 6:4

where

X is at least one element selected from the group consisting of Y, La, Gd and Lu and

Z is at least one of the elements selected from the group consisting of Cl, Br, I and F, said phosphor composition exhibiting color coordinates x and y within the tetragon with broken side lines in FIG. 1.

4,559,470

FLUORESCENT DISCHARGE LAMP

Katsuo Murakami; Hitoshi Yamazaki; Norihiko Tanaka, and Hiroshi Ito, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

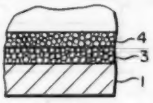
PCT No. PCT/JP82/00134, § 371 Date Nov. 17, 1982, § 102(e) Date Nov. 17, 1982, PCT Pub. No. WO82/03726, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 21, 1982, Ser. No. 444,392

Claims priority, application Japan, Apr. 22, 1981, 56-60798

Int. Cl.⁴ H01J *61/48*

U.S. Cl. 313—487 **8 Claims**



1. A fluorescent discharge lamp comprising a glass tube for surrounding a source of ultraviolet rays, and a plurality of successive phosphor layers coated on the inner surface of said glass tube, each of said phosphor layers containing a phosphor having a matrix and an activator in said matrix, wherein the concentration of said activator in the respective phosphor layers increases with increasing remoteness of said phosphor layer from said inner surface of said glass tube, the phosphors in each phosphor layer having the same components and the same activator, differing in the proportion of the activator in the respective phosphors.

4,559,471

DEVICE PROVIDED WITH A EVACUATED BULB COMPRISING A GETTER AND A GETTER AUXILIARY MEANS

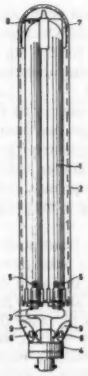
Wiggert Kroontje, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,923

Claims priority, application Netherlands, Apr. 28, 1982, 8201750

Int. Cl.⁴ H01J *7/18, 35/20, 61/26*

U.S. Cl. 313—553 **7 Claims**



1. A device provided with an evacuated bulb in which bulb there are present as activated metallic getter and an auxiliary means for the getter, characterized in that the auxiliary means is capable of disintegrating methane at a temperature of 350° C. and comprises an inorganic porous carrier charged with at least one transition metallic material selected from the group consisting of rhodium, copper, platinum, palladium and oxides thereof.

4,559,472

HIGH-PRESSURE DISCHARGE LAMP HAVING SUPPORT STRUCTURES FOR THE ELONGATE ELECTRODES THEREOF

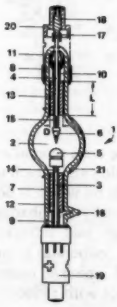
Walter Triebel, and Heinz Bunke, both of Eichstätt, Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,385

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205401

Int. Cl.⁴ H01J *61/073, 61/36*

U.S. Cl. 313—623 **20 Claims**



1. In an elongated high-pressure discharge lamp (1) including a glass envelope defining a discharge space (2) and envelope end portions (7, 8) extending away from said discharge space;

elongate electrode portions (3, 4) extending respectively through said envelope end portions (7, 8);

electrodes (5, 6) carried at the inner end portions of the electrode portions (3, 4), and spaced from one another within said discharge space (2);

means (9, 10, 11) for hermetically sealing outer end portions of the electrode portions (3, 4) in the envelope end portions (7, 8);

a respective support element (12, 13) fitted around each said electrode portion (3, 4) in spaced relation with the envelope end portions (7, 8) each of said support elements (12, 13) having an inner end near the discharge space, and an outer end in the envelope end portions (7, 8);

and retaining means (14, 15) engaging said support elements (12, 13) for holding the support elements (12, 13) in the respective envelope end portions (7, 8);

wherein,

said retaining means comprises resilient retaining elements (14, 15) engaging the inner end of the respective support element, each resilient retaining element being positioned between a respective electrode (5, 6) and the inner end of the respective support element (12, 13) for urging the outer end of the respective support element (12, 13) resiliently against a portion (9, 10) of said sealing means.

4,559,473

ELECTRODE STRUCTURE FOR HIGH PRESSURE SODIUM VAPOR LAMPS

Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

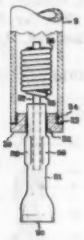
Continuation of Ser. No. 387,394, Jun. 11, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,858

Int. Cl.⁴ H01J *61/073, 61/34*

U.S. Cl. 313—630 **2 Claims**

1. An improved high pressure sodium vapor lamp having a

tubular light-transmitting ceramic envelope containing a reservoir of sodium-mercury amalgam in excess of the quantity vaporized during lamp operation with thermionic electrodes sealed into its ends and containing an inert gas filling, said sodium-mercury amalgam having been deposited in a predetermined amount in a niobium tube hermetically sealed at one end of said ceramic envelope with sealing composition, at least one of said electrodes comprising a pair of superposed helical



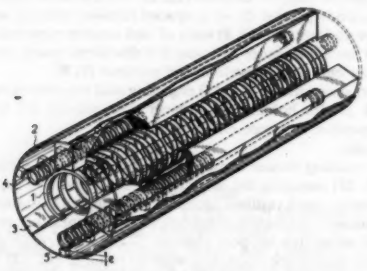
refractory metal wire coils wound around a tungsten shank in reversed pitch direction and which said inner helical coil having spaced apart turns on which is deposited an emission material consisting essentially of dibarium calcium tungstate, the improvement wherein said refractory metal wire coils are molybdenum which cooperates in providing improved physical retention of said emission material to provide increased initial lumens together with reduced lumen depreciation after 4000 hours of lamp operation.

4,559,474

TRAVELLING WAVE TUBE COMPRISING MEANS FOR SUPPRESSING PARASITE OSCILLATIONS

Robert Duret, Maurepas, and Dominique Henry, Elancourt, both of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 15, 1983, Ser. No. 523,624
Claims priority, application France, Aug. 20, 1982, 82 14433
Int. Cl.⁴ H01J *25/34*
U.S. Cl. 315—3.6 **7 Claims**



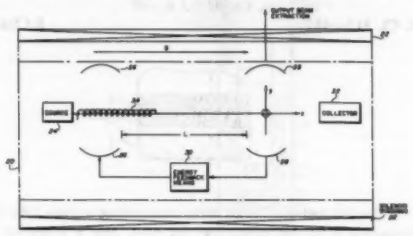
1. In a travelling wave tube comprising means for suppressing parasite oscillations, this tube comprising a helical type delay line placed in a metal sleeve to which it is fixed by dielectric supports, said means for suppressing parasite oscillations are formed by at least one auxiliary helical type delay line, placed inside the sleeve with each entirely within one of the gaps between two adjacent dielectric supports periodically fixed to the sleeve by metal supports and without contact with said delay line, the dimensions of the auxiliary delay lines and of the metal supports being calculated so as to attenuate the frequency zone in which parasite oscillations may occur.

4,559,475

QUASI-OPTICAL HARMONIC GYROTRON AND GYROKLYSTRON

Wallace Manheimer, Silver Spring, Md., and Baruch Levush, Haifa, Israel, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1984, Ser. No. 630,049
Int. Cl.⁴ H01J *25/00*
U.S. Cl. 315—4 **8 Claims**



1. A method for generating millimeter and submillimeter electromagnetic radiation at a desired harmonic ω_n of the cyclotron frequency in a quasi-optical gyrotron/gyroklystron configuration which includes a magnetic structure for producing a magnetic field parallel to an axial direction, an electron beam source for imparting momentum p_z to electrons in the axial direction to define an electron beam traveling in the axial direction, and for imparting momentum $P_\perp$ to the electrons in the beam perpendicular to the axial direction to cause the electrons in the beam to execute gyratory motion, and at least one open resonator defined by at least two mirrors positioned downstream of the electron beam source for receiving therethrough the beam of electrons and for exchanging energy with the beam of electrons, the method comprising the steps of:

choosing a mirror radius size ρ for the mirrors forming said at least one open resonator which is large enough relative to the spot size of a desired radiation cyclotron harmonic ω_n so that said harmonic ω_n oscillates within said at least one resonator, but small enough so that the spot size for the next lower cyclotron harmonic ω_m is larger than said mirror so that said harmonic ω_m does not oscillate due to diffraction losses;

generating an electron beam via said electron beam source with a beam current which is greater than or equal to the starting current I_n for the nth cyclotron harmonic ω_n, but less than the starting current I_m for the mth cyclotron harmonic ω_m; and

extracting radiation energy at the nth cyclotron harmonic ω_n from said at least one open confocal resonator.

7. A quasioptical gyrotron/gyroklystron for generating millimeter and submillimeter radiation at a desired harmonic ω_n of the cyclotron frequency, comprising:

means for producing a magnetic field parallel to an axial direction;

a relativistic electron beam source for imparting momentum to electrons in the axial direction to define an electron beam traveling in the axial direction, and for imparting momentum to the electrons in the beam perpendicular to the axial direction to cause the electrons in the beam to execute a gyratory motion, said beam source generating an electron beam with a beam current which is greater than or equal to the starting current I_n for the desired nth cyclotron harmonic, but less than the starting current I_m for the mth cyclotron harmonic;

at least one open resonator defined by at least two mirrors positioned downstream of the electron beam source for receiving therethrough the beam of electrons and for exchanging energy between the beam of electrons and the wave mode fields set up in said resonator, wherein for a

given cyclotron harmonic frequency ω_n, a desired diffraction loss Y_n for that harmonic n, a given half length separation L_y between the mirrors, and a given mirror radius of curvature R_M, the mirror radius size ρ for the mirrors forming said at least one resonator being determined by the equation

$$Y_n = \exp -(\rho/r_{on})^2,$$

where γ_{on} is the spot size at the mirror for radiation at the nth cyclotron harmonic and is calculated

$$r_{on} = \left[\frac{\lambda_o R_M}{n\pi} \quad \frac{1}{\left(\frac{R_M}{L_y} - 1\right)^{\frac{1}{2}}}\right]^{\frac{1}{2}},$$

where λ_o is the wavelength of the fundamental cyclotron frequency and n is the harmonic number for the desired cyclotron harmonic ω_n;

a collector electrode positioned downstream of the second resonator for collecting the electrons in the beam; and

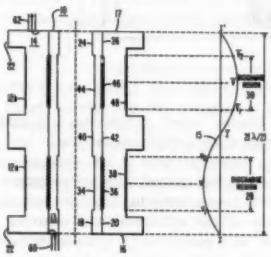
means for extracting radiation energy at the nth cyclotron harmonic from said second open confocal resonator.

4,559,476

RADIO-FREQUENCY AMPLIFIER

Merle V. Hoover, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1983, Ser. No. 536,086
Int. Cl.⁴ H01J *7/46, 19/18*
U.S. Cl. 315—39 **7 Claims**



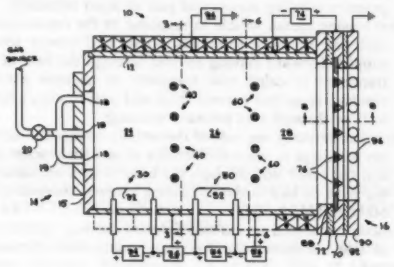
1. A radio-frequency amplifier having at least two double-ended; mechanically serially connected electron discharge devices in a first and a second coaxial cavity-resonator circuit, each of said discharge devices having a discharge region so that said amplifier comprises a plurality of longitudinally spaced apart, electrically connected discharge regions, each of said discharge devices having a cathode, an anode circumscribing said cathode, and at least one grid electrode disposed between said cathode and said anode, input means coupled to drive said first cavity-resonator circuit, and output means coupled to said second cavity-resonator circuit for extracting an output therefrom.

4,559,477

THREE CHAMBER NEGATIVE ION SOURCE

Ka-Ngo Leung, Hercules; Kenneth W. Ehlers, Alamo, and John R. Hiskes, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 10, 1983, Ser. No. 550,701
Int. Cl.⁴ H01J *27/02*
U.S. Cl. 315—111.81 **20 Claims**



1. A negative ion source comprising:

a vessel;

first and second magnetic filter means extending across said vessel dividing said vessel into an excitation chamber for creating vibrationally excited molecules and a negative ionization chamber for ionizing said excited molecules and an extraction chamber for extracting negative ions from said negative ionization chamber;

input means in fluid communication with said excitation chamber of said vessel for introducing neutral molecules into said excitation chamber;

a first discharge means operatively connected to said excitation chamber for emitting electrons of sufficient energy for vibrationally exciting said neutral molecules;

a second discharge means operatively connected to said negative ionization chamber for emittng ionizing electrons for ionizing said vibrationally excited neutral molecules;

extractor means coupled to said extraction chamber producing a positive electric field for extracting negative ions from said excitation chamber; and

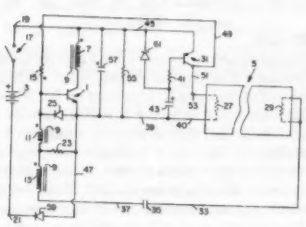
at least one plasma grid positioned adjacent to said extraction chamber being biased positive with respect to the plasma formed by said first and second discharge means.

4,559,478

FLUORESCENT LAMP CIRCUIT

Robert P. Fuller, Titusville, and Larry A. Nordstrom, Oviedo, both of Fla., assignors to U-Lite, Inc., Titusville, Fla.

Filed Jun. 28, 1983, Ser. No. 508,680
Int. Cl.⁴ H05B *41/24*
U.S. Cl. 315—224 **15 Claims**



1. A fluorescent lamp circuit comprising:

a pair of input terminals for connection across a low voltage d.c. power source;

a fluorescent lamp having a pair of electrodes at opposite ends of a gas-filled envelope;

a transformer having a ferromagnetic core on which a primary winding, a first secondary winding and a second secondary winding are wound, said secondary windings being connected in series with one another in voltage aiding relationship;

a bipolar transistor which, when conductive, connects said primary winding across said pair of input terminals;

first biasing means which, in response to the connecting of said pair of input terminals across said power source, supplies forward driving current through the base of said transistor to cause said transistor to become partially conductive so that current from said power source begins to flow through said primary winding;

means connecting one side of the serially-connected secondary windings to one end electrode of said fluorescent lamp and the other side through the base of said transistor via the path of said forward driving current thereof to the other end electrode;

a diode connected across said forward driving current path of said transistor in anti-polarity relationship therewith; and

a resistor connected from a common connection point of said serially-connected secondary windings to a common connection point of said diode, said forward driving current path of said transistor and one of said pair of input terminals;

said resistor, diode, secondary windings and the impedance of said fluorescent lamp providing biasing conditions for said transistor which cause the conductivity of said transistor to undergo successive time cycles upon said pair of input terminals being connected across said power source, one half period of each time cycle being characterized by a rise and fall of transistor conductivity from zero to full and back to zero, and the other half period by a continuing zero conductivity, each cycle being initiated by said first biasing means at least during the first few seconds of operation, whereby voltages of one polarity are induced across said secondary windings by said primary winding to drive current of one direction through said fluorescent lamp via the base of said transistor as said transistor experiences its conductive half cycle, and voltages of opposite polarity to said one polarity develop across said secondary windings to drive current of the opposite direction through said fluorescent lamp via said diode as said transistor experiences its non-conductive half cycle, the flow of lamp current via the base of said transistor effecting an automatic adjustment of the transistor base drive to regulate said lamp current.

4,559,479

STARTING AND DIMMING CIRCUIT FOR FLUORESCENT LAMPS

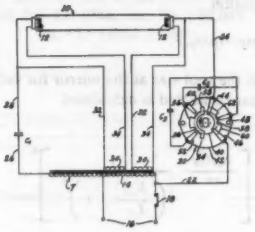
Robert D. Munson, Tupelo, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 506,084, Jun. 20, 1983, abandoned. This application Mar. 28, 1984, Ser. No. 594,332

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—239 **3 Claims**

1. Starting and dimming circuitry for a double ended fluorescent lamp having a discharge sustaining fill of mercury and an emitting filament at each end; comprising an AC power source, a first circuit means for applying a voltage across said lamp including said lamp and the secondary winding of a voltage step-up transformer having it primary winding connected across said power source, and a second circuit means for simultaneously applying a voltage across said filaments thereby to start lamp discharge, said second circuit means including separate secondary windings of said transformer each being connected in series with one of said filaments, said first circuit means further including impedance means for limiting current flow through said lamp, and means for selectively introducing additional impedances into said first circuit to selectively further limit current flow through said lamp, said means for selectively introducing additional impedance means into said first



circuit means comprising two capacitors having different values, circuit connections and switching means for selectively connecting said two capacitors in series with said lamp either in parallel with each other, in series with each other or individually.

4,559,480

COLOR MATRIX DISPLAY WITH DISCHARGE TUBE LIGHT EMITTING ELEMENTS

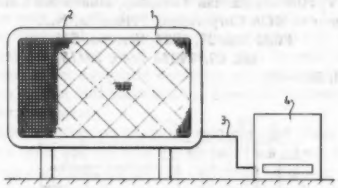
Erwin Nobs, Evilard, Switzerland, assignor to Omega SA, Bienne, Switzerland

Filed Nov. 15, 1983, Ser. No. 551,800

Claims priority, application France, Nov. 15, 1982, 82 20334

Int. Cl.⁴ H05B *41/38, 41/39*

U.S. Cl. 315—324 **6 Claims**



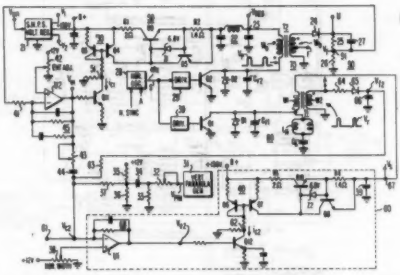
1. A matrix display board comprising a plurality of light emitting elements each comprising at least three discharge tubes containing mercury vapor at low pressure, the internal wall of each tube being coated with a fluorescent substance chosen to respond respectively to either the red, the green or the blue portion of the spectrum, and separate energizing means associated with each tube for independently controlling the variation of the light intensity emitted thereby so as to obtain light at the element output the resultant wavelength of which may extend over the entire visible spectrum, said separate energizing means comprising generator means for generating a high frequency current during a sequence of reference periods, each said reference period including a like plurality of cycles; and a plurality of gating means, each responsive to said high frequency current for selectively inhibiting the number of cycles of said current applied to a corresponding one of said tubes in a given reference period whereby the intensity of light emitted by one of said elements is varied by selectively varying the number of cycles of said current which are inhibited during a reference period from reaching the tubes comprising said one element.

4,559,481

RASTER WIDTH REGULATION CIRCUIT

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,947
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—411 12 Claims



1. Apparatus for regulating raster width, comprising:

a line deflection voltage regulator responsive to control signals for developing a first regulated voltage;

a line deflection circuit coupled to said line deflection voltage regulator for generating line scanning current in a line deflection winding, the amplitude of said scanning current being dependent on said first regulated voltage;

a high voltage regulator responsive to control signals for developing a second regulated voltage;

a high voltage generator coupled to said high voltage regulator for generating an ultor output voltage at an ultor terminal, the magnitude of said ultor output voltage being dependent on said second regulated voltage;

means coupled in a feedback path between said high voltage generator and said high voltage regulator for developing a first ultor control signal for said high voltage regulator that is representative of ultor output voltage to regulate said ultor output voltage; and

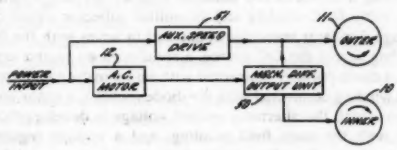
means coupled to said feedback path for developing a second ultor control signal for said line deflection voltage regulator that is representative of fluctuations in said ultor output voltage to vary said first regulated voltage in accordance therewith for providing raster width regulation.

4,559,482

AUTOMOTIVE RIM ROLL FORMING DRIVE SYSTEM

Vernon R. Fencl, Northbrook, Ill., assignor to Grotnes Metalforming Systems, Inc., Chicago, Ill.

Division of Ser. No. 301,394, Sep. 11, 1981, Pat. No. 4,357,561, which is a division of Ser. No. 129,725, Mar. 27, 1980, Pat. No. 4,320,327. This application Jun. 3, 1982, Ser. No. 384,507
Claims priority, application Japan, Apr. 6, 1979, 54-42349
Int. Cl.[4] H02K *17/34*
U.S. Cl. 318—50 1 Claim



1. An electric drive system for an automotive wheel rim forming system having inner and outer forming rolls mounted on driven spindles, said drive system comprising

drive means for the inner and outer spindles,

a mechanical differential output unit connecting said drive means to said spindles for maintaining a predetermined torque ratio between the inner and outer spindles during variations in the loads on said forming rolls during the forming of a wheel rim by said rolls, and

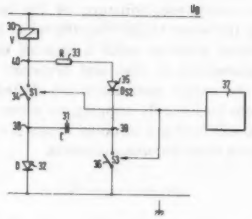
an auxiliary speed drive coupled to one of said spindles for maintaining a predetermined speed ratio between said inner and outer spindles in the absence of a working load thereon.

4,559,483

CONTROL DEVICE FOR INCREASING SPEED OF ACTUATION OF AN ELECTROMAGNETIC CONSUMER, PARTICULARLY IN AN INTERNAL COMBUSTION ENGINE

Werner Jundt, Ludwigsburg; Wolfgang Kosak, Möglingen, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,488
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327393
Int. Cl.[4] H02P *1/22*; H02M *3/06*
U.S. Cl. 318—301 5 Claims

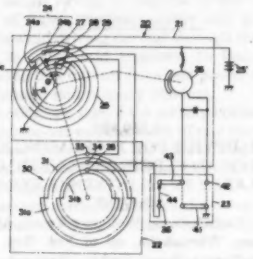


1. A control device for increasing speed of actuation of a direct current electromagnetic consumer, particularly for use in motor vehicles, comprising terminals to a direct current power source; a capacitor; and a two-position switchover device operable for connecting, in one switching position thereof, the capacitor across the power source terminals to charge the capacitor to the full voltage of the power source and, in another switching position thereof, connecting the charged capacitor in series with the electromagnetic consumer and the terminals at such a polarity that the charge of the capacitor is added to the voltage of the power source and the increased voltage is applied to the electromagnetic consumer, the electromagnetic consumer being connected to the positive power source terminal and the negative pole of the charged capacitor being connected in the other switching position to the electromagnetic consumer and the postitive pole of the charged capacitor being connected to the ground terminal of the power source, the switchover device including a first switching contact connected between the consumer and the capacitor, a second switching contact connected between the capacitor and the ground terminal of the power source, a series connection of resistor and a diode connected between the junction points of the first switching contact and the consumer and the junction point of the capacitor and the second switching contact, and a second diode connected between the junction point of the first switching contact and the capacitor and the ground terminal of the power source.

4,559,484
STOP-POSITION CONTROLLING DEVICE FOR ELECTRIC WINDSHIELD WIPER

Koki Hirano, Yokohama, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 19, 1984, Ser. No. 652,037
Claims priority, application Japan, Sep. 22, 1983, 58-175664; Sep. 22, 1983, 58-175665
Int. Cl.⁴ B60S *1/08*
U.S. Cl. 318—443 **7 Claims**



1. A device for controlling a stop-position of an electric windshield wiper, which comprises a means for converting rotary motion of a wiper motor into reciprocative motion of a wiper to oscillate a wiper blade on a surface to be wiped and a switch mechanism provide with armature shortcircuiting contacts for turning off the wiper motor from a power source and shortcircuiting the armature of the wiper motor to forcedly stop the wiper blade when the wiper blade reaches to a predetermined position under a turn-off state of a wiper switch, characterized in that said armature shortcircuiting contacts of the switch mechanism are shiftedly arranged at plural positions for forcedly stopping the wiper motor at different positions, and further a turnover means is arranged for the plural armature shortcircuiting contacts.

4,559,485
CONTROL SYSTEMS FOR AC INDUCTION MOTORS

James S. Whited, Radford, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Aug. 31, 1981, Ser. No. 297,809
Int. Cl.⁴ H02P *5/34*
U.S. Cl. 318—802 **5 Claims**

1. A velocity motor control system for an AC induction motor comprising:

a motor including

multiphase stator windings, and

an induction rotor;

means coupled to said rotor to produce a base pulse train including a predetermined number of pulses per revolution of said rotor;

a slip factor generator;

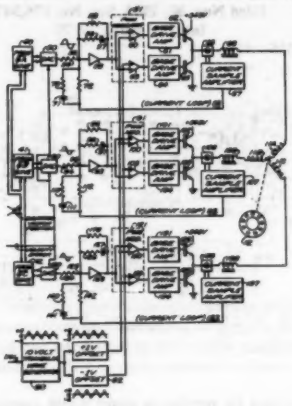
means coupled to said rotor and operatively connected to said slip factor generator to provide slip factors as a function of the speed of said rotor;

means connected to said slip factor generator and operative to modify slip factors in accordance with the desired motor torque;

means for producing a slip pulse train in accordance with the modified slip factor;

a counter responsive to said base train and said slip pulse train operatively connected to count pulses from both of said trains; and

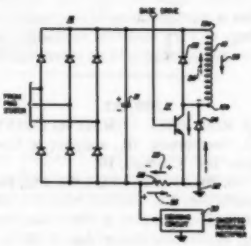
drive circuit means, having a voltage source interter, connected to said stator windings, said drive circuit being connected to said counter and being operative to synthesize sinusoidal excitation currents in accordance with the count on said counter.



4,559,486
DETECTOR FOR SHORTED ROTATING DIODE OF A BRUSHLESS ALTERNATOR

William Spencer, Rockford, and Melvin C. Jackovich, Stillman Valley, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1983, Ser. No. 565,346
Int. Cl.⁴ H02K *11/00*
U.S. Cl. 322—99 **5 Claims**



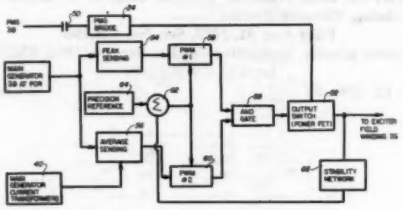
1. In a brushless alternator having an exciter field circuit including a source of DC potential with a reference, a stationary exciter field winding and an emitter collector circuit of a voltage regulator transistor connected in series with the field winding across the DC source, a rotor with an exciter armature, a diode rectifier connected with said armature and a main field winding connected with the diode rectifier, a stator winding in which the alternator output voltage is developed coupled with the main field winding, and a voltage regulator responsive to the alternator output providing a base drive signal to the voltage regulator transistor, an improved detector for a shorted diode rectifier, comprising:

a sensing circuit responsive to the direction of current flow through the exciter field winding for indicating the occurrence of a shorted diode on the rotor.

4,559,487
VOLTAGE REGULATOR WITH INDEPENDENT PEAK AND AVERAGE VOLTAGE SENSING

Cecil W. Sims, and Arthur Hill, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 7, 1984, Ser. No. 648,301
Int. Cl.[4] H02P 9/30
U.S. Cl. 322—24 14 Claims



1. A voltage regulator for a generating system having a main generator and an exciter for providing field current to the main generator, comprising:

means coupled to the main generator for sensing first and second operating parameters thereof;

means coupled to the sensing means for generating first and second pulse width modulated (PWM) signals based upon the first and second sensed operating parameters, respectively;

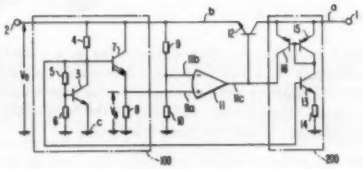
means coupled to the generating means for comparing the first and second PWM signals and passing only that PWM signal having the narrower pulse width; and

means responsive to said passed PWM signal for controlling the exciter to in turn regulate the output of the main generator.

4,559,488
INTEGRATED PRECISION REFERENCE SOURCE

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 28, 1983, Ser. No. 555,678
Claims priority, application Japan, Dec. 3, 1982, 57-212912
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—281 3 Claims



1. An integrated precision reference source comprising:

first and second feed lines;

a voltage output line;

a first transistor having a base, an emitter and a collector, said emitter of said first transistor being connected to said first feed line;

a first resistor connected between said base and said collector of said first transistor;

a second resistor connected between said base and said emitter of said first transistor;

a second transistor having a base, an emitter and a collector, said base of said second transistor being connected to said collector of said first transistor, and said collector of said second transistor being connected to said voltage output line, wherein the area of said emitter of said second transistor is larger than the area of said emitter of said first transistor;

a third resistor connected between said emitter of said second transistor and said emitter of said first transistor;

a fourth resistor connected between said collector of said first transistor and said voltage output line;

a voltage comparator having an output terminal, and first and second differential input terminals, said first differential input terminal of said voltage comparator being connected to said emitter of said second transistor;

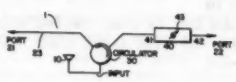
fifth and sixth resistors for supplying a divided voltage which is proportional to an output voltage which appears on said voltage output line, said divided voltage being supplied to said second differential input terminal; and

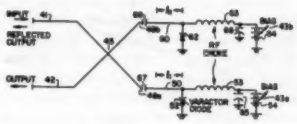
an output means connected between said second feed line and said voltage output line and coupled with said output terminal of said voltage comparator for supplying an output voltage proportional to an output current of said second transistor.

4,559,489
LOW-LOSS RADIO FREQUENCY MULTIPLE PORT VARIABLE POWER CONTROLLER

David C. Vacanti, Renton; John C. Read, Seattle, and Jimmy S. Takeuchi, Mercer Island, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,696
Int. Cl.[4] H01P 5/12
U.S. Cl. 333—1.1 12 Claims





1. A power control comprising:

a single input power port;

a plurality of power output ports;

power distribution means coupled to said input power port and to said power output ports for delivering substantially all of the input power applied to said input port to said plurality of output ports, said power distribution means receiving all of said input power, selectively transmitting a variable portion of said input power to one of the output ports coupled to the power distribution means, and reflecting out the portion of said input power not transmitted to said one output port; said power distribution means including a circulator, a variable reflection coefficient device, and a power distribution line operatively coupling said circulator to another of said power output ports;

said variable reflection coefficient device having a main terminal for receiving said input power and an output terminal for transmitting out a variable portion of said amount of input power to said one power output port; said variable reflection coefficient device having a voltage variable capacitance for setting the reflection coefficient of said variable reflection coefficient device at any desired value between 0 and 1 to control the proportion of said input power to be reflected back out to said main terminal and the portion of said input power to be transmitted from

said output terminal; and means for selecting the portion of input power transmitted to said output terminal, including electronically controlled power supply means for providing a variable voltage bias to said voltage variable capacitance; said variable reflection coefficient device further including a branch line coupler circuit having an input/output terminal connected to the device's associated circulator via said main terminal, and an output terminal connected to the device's associated output terminal; and wherein said voltage variable capacitance is associated with and coupled to said branch line coupler circuit and causes the branch line coupler circuit to couple a selected portion of the power received by its input/output terminal to its output terminal and to reflect out of its input/output terminal the portion of the received input power which is not coupled to said output terminal;

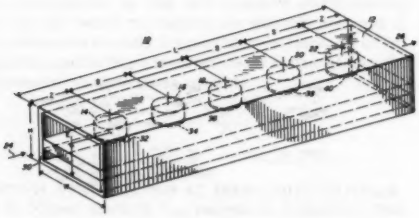
said circulator having an input terminal receiving said input power applied thereto from said input power port, an input/output terminal coupled to said main terminal of said variable reflection coefficient device, and an output terminal for transmitting the power reflected out from said variable reflection coefficient device into said circulator input/output terminal, thence to said power distribution line.

4,559,490

METHOD FOR MAINTAINING CONSTANT BANDWIDTH OVER A FREQUENCY SPECTRUM IN A DIELECTRIC RESONATOR FILTER

Mark A. Gannon, Schaumburg, and Francis R. Yester, Jr., Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1983, Ser. No. 567,433
Int. Cl.[4] H01P *1/208, 1/203, 1/219*
U.S. Cl. 333—202 **15 Claims**



1. A method of determining the spatial parameters of a plurality of resonators with respect to a propagating electromagnetic field having a maxima in a dielectric resonator filter comprising the steps of:

a. selecting a desired filter bandwidth and determining an interresonator coupling coefficient that produces the desired bandwidth about a center frequency within a frequency spectrum of interest,

b. choosing positions for the resonators along the direction of electromagnetic field propagation,

c. obtaining the required interresonator coupling by measuring and monitoring the interresonator coupling coefficient while altering the interresonator spacing,

d. altering the resonant center frequency of the resonators to some other center frequency within the spectrum of interest,

e. moving all of the resonators either toward or away from the electromagnetic field strength maxima or increasing or decreasing the interresonator spacing in proportion to the relative rate of change of the interresonator coupling coefficient as compared with the rate of change of the center frequency,

f. iterating steps c–e to the desired degree of precision,

whereby successive iterations converge upon a combination of parameters at which changes in center frequency are compensated by changes in interresonator couplings such that constant filter bandwidth is maintained at any filter center frequency throughout the frequency spectrum of interest.

4,559,491

METHOD AND DEVICE FOR LOCATING A FAULT POINT ON A THREE-PHASE POWER TRANSMISSION LINE

Murari M. Saha, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Aug. 31, 1983, Ser. No. 528,196
Claims priority, application Sweden, Sep. 14, 1982, 8205235
Int. Cl.[4] G01R *31/08*
U.S. Cl. 324—52 **8 Claims**

1. A method for locating a fault point within a section of a three-phase power transmission line located between a network positioned behind the said section and a network positioned ahead of the said section, wherein currents and voltages in the line, are measured at a measuring point arranged at one end of the said section and the distance between the measuring point and the fault point is computed with the aid of the measured values and the parameters of the said section, characterized in that

the type of the fault is determined,

the fundamental frequency components of the measured values are determined, and

on the basis of the type of fault and the complex values of the fundamental frequency components of the measured values and using a network model, which includes the influence of the infeed from the line ahead of said section, utilizing the impedance of the said section as well as values for the source impedances of the networks lying ahead of and behind the said section, eliminating possible zero sequence components in the fault current and using only positive sequence components and eliminating the influence of the fault resistance, the fault distance (n) related to the distance between the fault and the measuring point is determined as the solution of an equation

$$n^2+B\times n+C=0$$

which contains the fault distance (n) as a variable, the parameters (B, C) of which are dependent on the fundamental frequency components of the measured values and on the said impedances, and locating the fault based on the fault distance n and the measuring point.

4,559,492

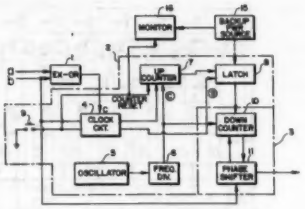
APPARATUS FOR AUTOMATICALLY PHASE-CALIBRATING

Yasuo Baba, and Ichiro Asano, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Sep. 14, 1982, Ser. No. 418,179
Claims priority, application Japan, Sep. 28, 1981, 56-155352
Int. Cl.[4] G01R *25/00;* **H03L** *7/00;* **G04C** *11/00*
U.S. Cl. 324—83 D **5 Claims**

1. An apparatus for automatically phase-calibrating, said apparatus comprising: a means for detecting phase shifts between two repeated square wave signals havng equal frequency and duty cycles; a means for integrating said detected phase shifts during a predetermined number of cycles of said square wave signals and for calculating the mean value per cycle from said integrated value; a means for shifting a phase of

one square wave signal by a phase shift equivalent to said mean value so that a phase of said one square wave signal overlaps a phase of another square wave signal; wherein a means for calculating the mean value per cycle comprises a timing clock connected to a phase shifts-detecting counter for enabling said phase shifts-detecting counter to count phase shifts-detecting



signals from said means for detecting phase shifts during said predetermined number of cycles of said repeated square wave signals, a counter for counting clock pulses output from said timing clock only during a period when said phase shifts-detecting signals are counted by said phase shifts-detecting counter, and a latch circuit for latching the value counted by said counter.

4,559,493

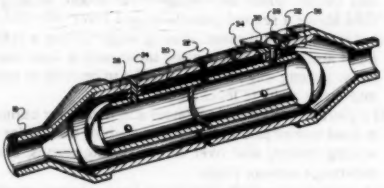
METER FOR MEASURING THE CONCENTRATION OF WATER IN A WATER-INK MIXTURE

Ira B. Goldberg; Kwang E. Chung, both of Thousand Oaks, Calif., and Thomas A. Fadner, Oshkosh, Wis., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 1, 1984, Ser. No. 616,106

Int. Cl.[4] G01N *27/22*

U.S. Cl. 324—61 R **7 Claims**



1. A meter for measuring the concentration of water in a fluid mixture of ink and water, said meter comprising:

a capacitor cell for containing a fluid mixture;

an audio-frequency oscillator circuit which utilizes said capacitor cell for providing capacitance in said oscillator circuit so that said oscillator circuit provides an output frequency which is inversely proportional to the dielectric constant of said fluid;

a frequency to voltage converter which receives said output frequency of said oscillator circuit and converts it to a first voltage output which is directly proportional to said output frequency;

a logarithmic amplifier which receives said first voltage output of said frequency-voltage converter and converts it to a second voltage output which is proportional to the logarithm of said first voltage output and is directly proportional to said concentration of water in said fluid mixture in said capacitor cell; and

a display means which receives said second voltage output of said logarithmic amplifier and displays it, whereby said concentration of water in said fluid mixture in said capacitor cell can be measured.

4,559,494

MAXIMUM DEMAND METER

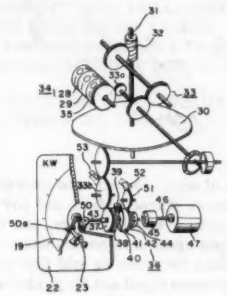
Shigeki Takeshita, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,167

Claims priority, application Japan, May 27, 1982, 57-91648; Apr. 13, 1983, 58-66511

Int. Cl.[4] G01R *11/64*

U.S. Cl. 324—103 R **15 Claims**



1. A maximum demand meter for determining maximum average power consumption for a series of measuring periods, for use with an integrating wattmeter of the type that comprises a rotating member whose angular velocity is proportional to the rate of consumption of electric energy, said maximum demand meter comprising:

a pointer mounted for arcuate movement;

a push arm fixedly mounted on a center shaft for movement from a zero position to push said pointer in response to rotation of said center shaft in a first direction during a measuring period;

first and second sun gears and a planet gear in contact therewith, said planet gear being fixedly attached to and mounted for orbital rotation about said center shaft;

driving gear means for drivingly connecting said first sun gear with said rotating member of said wattmeter;

zero-returning means for returning said push arm to said zero position at the end of a measuring period, said zero-returning means being coupled to said second sun gear for rotating said second sun gear at the end of a measuring period, thereby to cause said planet gear to rotate said center shaft in a second direction;

first pawl means for selectively preventing rotation of said first sun gear during operation of said zero-returning means; and

second pawl means for selectively preventing rotation of said second sun gear during said measuring period.

4,559,495

TRANSDUCER FREE OF ANY MAGNETIC CORE FOR CONTACTLESS CURRENT MEASUREMENT

Heinz Lienhard, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Mar. 22, 1982, Ser. No. 360,363

Claims priority, application Switzerland, Mar. 26, 1981, 2038/81

Int. Cl.[4] G01R *33/00, 1/20*

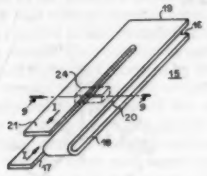
U.S. Cl. 324—117 R **6 Claims**

1. A current measuring device for measuring a current flowing in a two-legged U-shaped strip without the use of a magnetic core, said current generating a first primary magnetic field near the first leg of said U-shaped conductor and a second primary magnetic field near the second leg of said U-shaped conductor, said first and second primary magnetic fields being oppositely oriented,

said current measuring device comprising:

(a) a first magnetic field sensor located proximate said first leg of said U-shaped conductor for detecting said first primary magnetic field and any stray magnetic field present near said conductor and for producing a first output signal in response thereto;

(b) a second magnetic field sensor located proximate said



second leg of said U-shaped conductor for detecting said second primary magnetic field and any stray magnetic field present near said conductor, and for producing a second output signal in response thereto, and

(c) circuit means for receiving said first output signal and said second output signal and for producing a third output signal proportional to said current to be measured and substantially independent of said stray magnetic field.

4,559,496

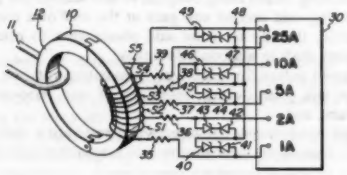
LCD HOOK-ON DIGITAL AMMETER

John D. Harnden, Jr., Schenectady, and William P. Kornrumpf, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 286,490, Jul. 24, 1981, Pat. No. 4,471,300. This application Jun. 4, 1984, Ser. No. 617,285

Int. Cl.⁴ G01R *1/20, 15/00*

U.S. Cl. 324—127 **8 Claims**



1. A hook-on digital ammeter comprising

an annular magnetic core interrupted at at least one location such that the core material at opposite sides of the interruption is sufficiently separable to allow passage of a conductor through the interruption;

a secondary winding wound on said core, said secondary winding being tapped at a plurality of points thereon;

liquid crystal display means comprising a plurality of display segments having a common connection; and

circuit means coupling a separate one of said taps; respectively, to a separate segment of said liquid crystal display means, respectively, said common connection being connected to one end of said secondary winding such that the optically response state of each segment of said liquid crystal display means is directly determined by the amplitude of AC voltage across said secondary winding.

4,559,497

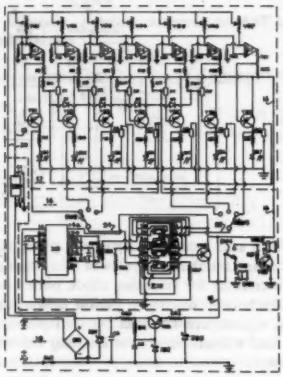
RANGED VOLTAGE MONITOR WITH OUT-OF-RANGE ENUNCIATORS

Anthony Farrugia, 5034 Edenview Dr., San Jose, Calif. 95111

Filed Jul. 6, 1982, Ser. No. 394,902

Int. Cl.⁴ G01R *19/14;* G08B *21/00*

U.S. Cl. 324—133 **11 Claims**



1. A ranged voltage monitor comprising:

(a) under-range sensing means having a reference input, a sensing input, and an output, said under-range sensing means being operative to develop an under-range signal at said output when the voltage level at said sending input drops below a first predetermined level;

(b) over-range sensing means having a reference input, a sensing input, and an output, said over-range sensing means being operative to develop an over-range signal at said output when the voltage level at said sensing input rises above a second predetermined level;

(c) at least one mid-range sensing stage having a reference input and at least one sensing input, said at least one mid-range sensing stage being operative to develop at least one mid-range voltage level signal;

(d) a plurality of visual indicators and means for connecting at least one of said indicators to each of said under-range sensing means, said over range sensing means, and said mid-range sensing stage;

(e) a dual-level audible enunciator having inputs coupled to signals produced by the outputs of said under-range sensing means and said over-range sensing means; and

(f) disabling means coupled to said indicators for disabling all but one indicator associated with the highest sensed voltage level.

4,559,498

SYMMETRICAL INTEGRATOR AND APPLICATION OF SAID INTEGRATOR TO AN ELECTRIC FILTER

Boris Sokoloff, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuites Integres Speciaux E.F.-C.I.S., Grenoble, France

Filed Sep. 24, 1982, Ser. No. 422,391

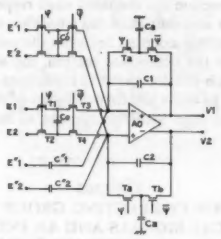
Claims priority, application France, Oct. 2, 1981, 81 18637

Int. Cl.⁴ G06G *7/186*

U.S. Cl. 328—127 **5 Claims**

1. A symmetrical integrator for use in a switched capacitor filter, comprising an operational amplifier having two floating inputs of which one being an inverting input and the other being a non-inverting input and two floating outputs; two identical feedback capacitors, each connected between an input and a respective output of the operational amplifier; a third capacitor having one terminal connected by a first insu-

lated gate transistor to a first input of the integrator, and having a second terminal connected by a second insulated gate transistor to a second input of the integrator, said one terminal being connected through a third transistor insulated gate to said inverting input of the operational amplifier and said second terminal being connected through a fourth insulated gate transistor to said non inverting input, said floating outputs of



the operational amplifier being the outputs of the integrator, and

means for periodically turning-on simultaneously said first and second insulated gate transistors while said third and fourth insulated gate transistors are non-conducting and for turning-on simultaneously said third and fourth insulated gate transistors while said first and second insulated gate transistors are non-conducting.

4,559,499

DIRECT MICROWAVE DEMODULATOR OF PSK SIGNALS WITH AUTOMATIC GAIN CONTROL

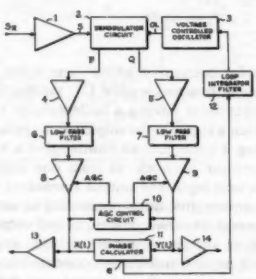
Jacques Bursztejn, Paris, and Michel Part, Les Essarts le Roi, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 20, 1984, Ser. No. 591,448

Claims priority, application France, Mar. 25, 1983, 83 04983

Int. Cl.[4] H03D *3/18, 3/24*

U.S. Cl. 329—50 **3 Claims**



1. A microwave reception chain comprising a circuit for direct demodulation of a modulated signal resulting from mixing two carriers in quadrature modulated by digital signals scrambled so as not to comprise long series of ones or zeros, of which the input is coupled with the received signal input, associated with an oscillator operated at the carrier frequency of the received signal, controllable so that the phase of the carrier coming from the oscillator coincides with the phase of the signal received and supplying demodulated digital signals, and furthermore comprising a phase calculator having two inputs coupled to the outputs for demodulated digital signals, of which the output provides a signal as a function of the phase difference between the received carrier and the local carrier, this output being connected to the control input of the oscillator via a loop integrator filter, wherein the arrangement also comprises means for automatically controlling the level of the demodulated digital signals X(t) and Y(t), comprising wideband amplifiers whose signal inputs are coupled to the outputs of the direct demodulation circuit, and which comprise automatic gain control inputs, the outputs of these amplifiers being connected to the inputs of a control circuit comprising integrating means, and of which the outputs are connected to the control inputs of the amplifiers.

4,559,500

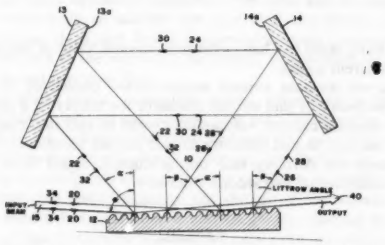
MIRROR-GRATING TUNING ARRANGEMENT FOR HIGH RESOLUTION LASERS

Iain S. McDermid, Pasadena, and Thomas J. Pacala, La Canada, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 9, 1981, Ser. No. 310,211

Int. Cl.[4] H01S *3/086, 3/10;* **G01B** *9/02*

U.S. Cl. 330—4.3 **2 Claims**



1. A tuning arrangement for a tunable laser in which a tunable beam is amplifiable in the laser cavity, the arrangement comprising:

a single diffraction grating; and

beam steering means comprising first and second reflective mirrors positionable with respect to said grating for causing a beam directed to said grating from said cavity to be diffracted three times by said grating prior to being redirected to said cavity for further amplification, said first and second mirrors being positioned with respect to said single grating to cause said beam directed to said single grating from said cavity to be diffracted by the grating and to be directed to said first mirror and therefrom to be reflected to said second mirror from which it is reflected to said single grating at a Littrow angle with respect to said grating, with the beam after being diffracted a second time by said grating then being directed back to said second mirror for reflection to said first mirror and thence back to said grating where the beam is diffracted a third time before it is returned to said cavity.

4,559,501

SIGNAL TRANSLATING CIRCUIT

Tooru Akutagawa, and Yukihiko Machida, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,099

Claims priority, application Japan, Dec. 30, 1982, 57-234248

Int. Cl.[4] H03F *1/34, 3/04*

U.S. Cl. 330—293 **6 Claims**

1. A signal translating circuit for supplying an output current signal, comprising;

negative feedback means including first and second transistors each having a base, a collector, and an emitter, said collector of said first transistor coupled to said base of said second transistor and said emitter of said second transistor coupled to said base of said first transistor;

biasing current source means connected to said base of said first transistor;

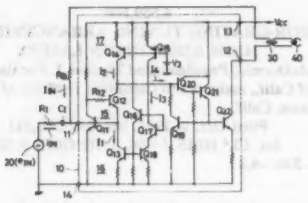
input resistor means connected between said base of said first

transistor and a source of an input voltage signal for converting said input voltage signal into an input current signal to be supplied to said base of said first transistor;

first constant current source means connected to said emitter of said second transistor for supplying a first constant current flowing to said emitter of said second transistor, said first constant current being selected to be substantially equal to a half of the peak-to-peak value of said input current signal;

second constant current source means connected to said collector of said second transistor for supplying a second constant current, substantially equal to said first constant current, to said collector of said second transistor; and

means for deriving said output current signal from said collector of said second transistor.

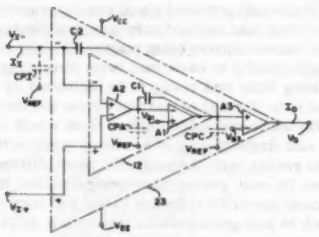


4,559,502

MULTI-STAGE AMPLIFIER WITH CAPACITIVE NESTING FOR FREQUENCY COMPENSATION

Johan H. Huijsing, Den Hoorn, Netherlands, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 19, 1984, Ser. No. 602,234
Int. Cl.⁴ H03F *1/34*
U.S. Cl. 330—294 **25 Claims**



1. An amplifier for amplifying an input signal received at least partially at an inverting input thereof to produce an inverted output signal at an ouput thereof, the amplifier comprising:

a composite amplifier section comprising:

a first stage for amplifying an input signal received at least partially at an inverting input thereof to produce an inverted output signal at an output thereof;

a second stage for amplifying an input signal received at least partially at a non-inverting input thereof to produce a non-inverted output signal at an output thereof, the output of one of the two stages coupled to the input of the other of the two stages, the composite section having an inverting input and an output respectively coupled to the remaining input and output of the two stages; and

a first capacitor coupled between the output and inverting input of the first stage, the first capacitor being of such a value as to be sufficient in itself to make the forward gain of the composite section roll off no more than 9dB/octave out to its unity-gain frequency;

a third stage for amplifying an input signal received at least partially at a non-inverting input thereof to produce a non-inverted output signal at an output thereof, the output of one of the composite section and the third stage coupled to the input of the other of the composite section and the third stage, the remaining input and output of the composite section and the third stage respectively coupled to the input and output of the amplifier; and

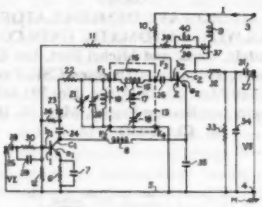
a second capacitor coupled between the output and inverting input of the composite section, the second capacitor being of such a value that the capacitors are sufficient in themselves to make the forward gain of the amplifier roll off no more than 9 dB/octave out to its unity-gain frequency.

4,559,503

AMPLIFIER FOR CORRECTING GROUP TIME DELAY OF ELECTRICAL SIGNALS AND AN INTERMEDIATE FREQUENCY AMPLIFIER STAGE FOR RADIO EQUIPMENT COMPRISING AN AMPLIFIER OF THIS KIND

Michel Camand, Courbevoie, and Jean-Pierre Chobert, Bois Colombes, both of France, assignors to Alcatel Thomson Faiscequx Hertziens, France

Filed Jan. 29, 1985, Ser. No. 696,140
Claims priority, application France, Jan. 31, 1984, 84 01465
Int. Cl.⁴ H03F *3/191*
U.S. Cl. 330—302 **10 Claims**



1. Amplifier for correcting group time delay of electrical signals, comprising first and second DC voltage supply terminals, an input transistor having a collector, an emitter and a base and to which a signal to be amplified is applied, an output transistor having a collector, an emitter and a base, a group time delay corrector network, at least one capacitor and a choke, wherein said input and output transistors have respective collector-emitter junctions connected in series between said first and second terminals, said input and output transistors are configured as common-emitter voltage amplifiers, said collector of said input transistor is connected to said base of said output transistor through said group time delay corrector network, and said emitter of said output transistor is connected to one of said terminals through said at least one capacitor and connected to said collector of said input transistor through said choke.

4,559,504

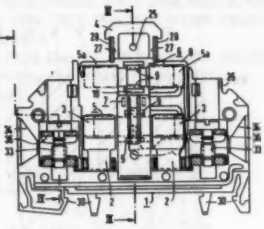
FUSE TERMINAL

Zdenek Krec, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,382
Int. Cl.⁴ H01H *85/02*
U.S. Cl. 337—194 **15 Claims**

1. A fuse terminal having a socket including stationary contacts, an operating element having a fuse carrier and switching contacts cooperating with the stationary contacts, said fuse carrier having said switching contacts formed thereon

through a retainer for fuse inserts, said fuse inserts including two oppositely spaced switching contact elements, a guide member having said fuse carrier locked therein, said fuse carrier being rotationally mounted in said guide member, said guide member being displaceably and raisably supported in



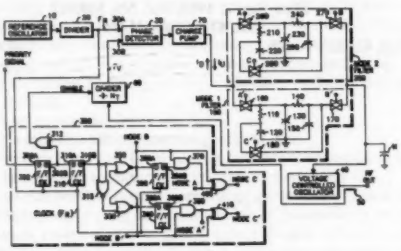
said socket, cover rails covering said fuse carrier and the stationary contacts in the socket against touching in the inserted as well as in the raised position thereof, and whereby in the raised and transversely rotated position said cover rail providing an access to the retainer for the fuse insert.

4,559,505

FREQUENCY SYNTHESIZER WITH IMPROVED PRIORITY CHANNEL SWITCHING

José I. Suaréz, Miami; James S. Irwin, Ft. Lauderdale, and Wayne P. Shepherd, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1983, Ser. No. 455,454
Int. Cl.⁴ H03L *7/00*
U.S. Cl. 331—1 A **5 Claims**



1. A frequency synthesizer comprising:

reference frequency generating means for generating a reference signal exhibiting a predetermined frequency F_R;

phase detector means, having first and second inputs, said first input being coupled to the output of said frequency generating means, for generating a signal exhibiting indicia of the difference in frequency and phase between signals applied to said first and second input thereof;

a first low pass filter switchably coupled to the output of said phase detector means;

a second low pass filter switchably coupled to the output of said phase detector means;

voltage controlled oscillator means, switchably coupled to the respective outputs of said first and second low pass filters, for generating a radio frequency signal at the output thereof which exhibits a frequency which is a function of the voltage applied at the input thereof;

frequency divider means, having an input coupled to the output of said oscillator means, for dividing the signal generated at the output of said oscillator means by a predetermined quality to generate a divided down signal F_V which is provided to the second input of said phase detector means;

switching means, responsive to a timing signal and coupled to said first and second filters, said switching means being operative in a first mode to switchably couple said first filter between the output of said phase detector means and the input of said oscillator means for providing a first output frequency from the voltage controlled oscillator means, said switching means being operative in a second mode to switchably couple said second filter between the input of said phase detector means and the input of said oscillator means for providing a second output frequency from the voltage controlled oscillator means, and

timing signal generating means, coupled to said switching means, for generating a timing signal which instructs said switching means to switch back and forth between said first and second modes at predetermined points in time,

said switching means comprising first and second transmission gates operatively coupled to the input and the output, respectively, of said first low pass filter and further comprising third and fourth transmission gates operatively coupled to the input and the output, respectively, of said second low pass filter,

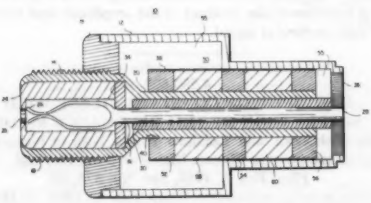
said timing signal generating means, generating a timing signal to actuate said second gate prior to actuating said first gate when switching to said first low pass filter, and generating a timing signal to actuate said fourth gate prior to actuating said third gate when switching to said second low pass filter, whereby the output of the selectively coupled low pass filter is first selectively coupled to the voltage controlled oscillator means prior to selectively coupling the low pass filter to the phase detector means.

4,559,506

TEMPERATURE COMPENSATED COAXIAL CABLE ISOLATOR

Raymond G. Capek, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 5, 1984, Ser. No. 628,005
Int. Cl.⁴ H03H *7/01;* **H01P** *1/202, 5/02*
U.S. Cl. 333—181 **6 Claims**



1. A temperature compensated coaxial isolator for coupling television signals while blocking low frequency power currents comprising:

an outer ground conductor having an interruption therein;

capacitive signal coupling means and EMI absorption means in the interruption;

a plurality of individual capacitive elements in said capacitive signal coupling means; and

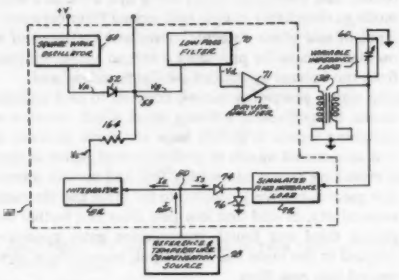
said individual capacitive elements having temperature coefficients selected to exhibit a capacitance substantially in the range of 3.8 to 5 nanofarads over a temperature variation from about 0 degrees Centigrade to +45 degrees Centigrade.

4,559,507

CONTROLLED HYBRID MICROCIRCUIT OSCILLATOR

Kurt A. Ramsdale, and Richard M. Harter, both of Vergennes, Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,574
Int. Cl.[4] H03L *5/00*
U.S. Cl. 331—183 **9 Claims**



1. An amplitude-corrected signal source for inducing a fixed AC current in an element of a given fixed electrical impedance, said source comprising:

a square wave oscillator for producing a square wave signal at its output;

a first summing node;

rectifier means connected between the output of the square wave oscillator and said first summing node for rectifying said square wave signal;

low-pass filter means having an input connected to said first summing node for receiving said rectified square wave signal and for producing a corresponding alternating current sinusoidal signal;

a second summing node having one input thereto connected to a terminal to receive a feedback current responsive to the amplitude and frequency of said sinusoidal signal and having another input connected to a terminal to receive a constant reference current of opposite polarity and to produce a resultant output error current; and

an integrator having its input connected to receive said error current and an output connected to supply said first summing node with a direct current voltage level which changes as a function of the product of the amplitude and frequency of said sinusoidal signal.

4,559,508

DISTRIBUTION CONSTANT FILTER WITH SUPPRESSION OF TE11 RESONANCE MODE

Toshio Nishikawa, and Tadahiro Yorita, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 8, 1984, Ser. No. 578,199
Claims priority, application Japan, Feb. 10, 1983, 58-18909[U]
Int. Cl.[4] H01P *1/201, 1/202*
U.S. Cl. 333—202 **26 Claims**

1. A distribution constant type filter, comprising:

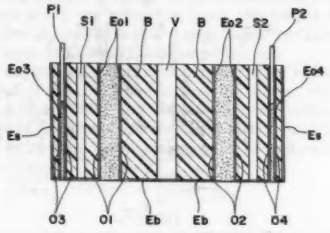
(A) a resonance unit including:

(1) a dielectric block member having an outer surface, and having formed therein a pair of spaced apart first cavities extending from respective locations on said outer surface, each said first cavity forming a respective first inner surface;

(2) a conductive layer formed on at least part of said outer surface of said dielectric block member and extending into each of said first cavities and covering at least a portion of each of said first inner surfaces; and

(B) connecting means for introducing an input signal into said resonance unit and withdrawing an output signal from said resonance unit, said connecting means including:

(1) an opening formed in said block member at a location adjacent to but spaced from one of said first cavities; and



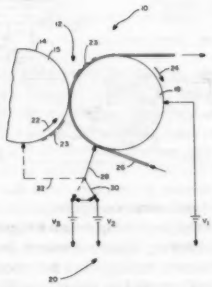
(2) a connector member located in said opening and electrically shorted to said conductive layer, said connector member extending outside of said opening so that it can be connected to an external circuit, the location and dimensions of said opening being such that magnetic coupling between said resonance unit and connecting means suppresses a TE11 resonance mode in said filter.

4,559,509

ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING ELECTRICALLY BIASED TRANSFER STATION AND METHOD

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Sep. 2, 1983, Ser. No. 529,082
Int. Cl.[4] G03G *15/16*
U.S. Cl. 355—3 TR **7 Claims**



1. In an electrophotographic copying apparatus in which electrically charged toner of one polarity is transferred from an oppositely electrically charged surface of its photoconductive drum to the front side of a blank sheet for transforming the latter into an intended copy as the back side of the sheet engages the outer surface of a transfer roll positioned adjacent said drum, the improvement comprising means for simultaneously electrically biasing the front side of said blank sheet, before the latter receives said toner, and the outer surface of said transfer roll such that each carries the same charge as said drum surface and such that the combined voltage level of both is greater than the voltage level of the charged surface of said drum, whereby to cause toner to be transferred from said drum surface to said blank sheet; said biasing means including means for changing said combined voltage level.

4,559,510
EQUIPMENT PROTECTING ELECTRICAL CIRCUIT BREAKER

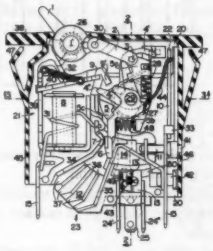
Herbert Franz, Alzenau, Fed. Rep. of Germany, assignor to Heinrich Kopp GmbH & Co. KG., Kahl, Fed. Rep. of Germany

PCT No. PCT/EP82/00224, § 371 Date Mar. 2, 1984, § 102(e) Date Mar. 2, 1984, PCT Pub. No. WO84/01663, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 11, 1982, Ser. No. 595,568

Int. Cl.⁴ H01H *75/00, 75/12*

U.S. Cl. 335—13 **10 Claims**



1. An equipment protecting compact electrical circuit breaker having a narrow thickness, comprising housing means, a breaker mechanism including circuit breaker contact means mounted in said housing means, a mechanical cockable drive for operating said breaker mechanism with its breaker contact means, said circuit breaker further comprising three separate release means including manual release means, electromagnetic release means, and electrothermal release means all operatively arranged for freely releasing said breaker mechanism, an arc quenching device, said breaker mechanism being located for cooperation with said arc quenching device for extinguishing a switching arc, and further including an integrated signal changing switch, a combination of components including:

(a) a cocking body (5) having a plurality of functional projections,

(b) an unlatching lever (4),

(c) a movable tilting contact piece (6), and

(d) a cam lever (14) for actuating said signal changing switch in response to movement of said cocking body (5),

said circuit breaker further comprising a common rotation axis for tiltably supporting said combination of components on said common rotation axis in said housing means, whereby said unlatching lever cooperates with a first functional projection of said functional projections of said cocking body and said tilting contact piece cooperates with a second functional projection of said functional projections, said circuit breaker further comprising first spring means arranged for biasing said cocking body in an off-position, second spring means for maintaining a spring bias between said unlatching lever and said first functional projection, and third spring means for maintaining a spring bias between said tilting contact piece and said second functional projection.

4,559,511
VACUUM CONTACTOR HAVING DC ELECTROMAGNET WITH IMPROVED FORCE WATTS RATIO

Robert T. Basnett, Hendersonville, N.C., and Walter V. Bratkowski, McKeesport, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1983, Ser. No. 486,584

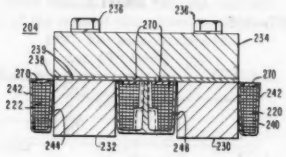
Int. Cl.⁴ H01H *51/08*

U.S. Cl. 335—132 **11 Claims**

8. A magnetic core for a DC electromagnet for use in a vacuum contactor comprising:

a solid magnetically permeable U-shaped core having a base and a pair of legs separably attached thereto;

fastening means for attaching the legs to the base;



a non-magnetic adhesive-backed shim intermediate the base and legs with the shim adhering to the base with the fastening means piercing the shim during attachment of the legs to the base.

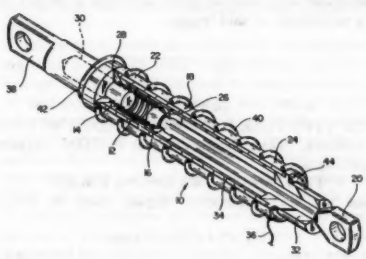
4,559,512
SELF-PROTECTING AND CONDITIONING MEMORY METAL ACTUATOR

John R. Yaeger, Sunnyvale, and Robert K. Morgan, Pleasant Hill, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 474,931, Mar. 14, 1983, Pat. No. 4,490,975. This application Dec. 28, 1984, Ser. No. 687,049

Int. Cl.⁴ H01H *61/08;* **F01B** *29/10*

U.S. Cl. 337—140 **13 Claims**



1. A shape-memory-effect actuator comprising:

a shape-memory-alloy spring having first and second ends;

a first actuator termination connected to the second end of the alloy spring;

a means;

a compensator spring having first and second ends, said compensator spring second end operatively connected in series by said means to said alloy spring first end; and

a second actuator termination connected to the first end of the compensator spring;

said shape-memory-alloy spring upon recovering with each operating cycle exerting a force throughone of said first and second actuator terminations;

said compensator spring being capable of elastic movement in conjunction with the recovery of said alloy spring during normal operation wherein the alloy spring fully recovers with each operating cycle;

said compensator spring further being capable of elastic movement in conjunction with the recovery of said alloy spring during abnormal operation when the actuator is subjected to a jam or other excessively high stress condition wherein the alloy spring fully recovers.

4,559,513

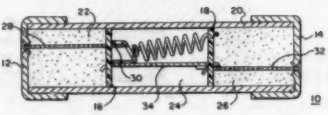
TRIGGER MECHANISM FOR DUAL-ELEMENT FUSE

Aldino J. Gaia, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 10, 1984, Ser. No. 649,135

Int. Cl.[4] H01H *85/04*

U.S. Cl. 337—165 **8 Claims**



1. An electric current limiting fuse comprising first and second spaced conductor members, a relatively rigid, one-piece trigger of a generally U-shaped configuration, said trigger having first and second legs joined by a bight portion, a first mass of heat softenable alloy connecting said first leg of said trigger to said first conductor member and a second mass of heat softenable alloy connecting said second leg of said trigger to said second conductor member to complete an electrical circuit therebetween, biasing means attached to the bight portion of said trigger, and said first conductor member having a substantially planar free end underlying said first leg of said trigger and said second conductor member having a substantially planar upper surface portion underlying said second leg of said trigger, said planar surfaces being substantially parallel and said biasing means urging said trigger in a direction at an essentially acute angle to said planar surfaces to effect rapid and complete separation between the trigger and the conductor members upon conducting an overcurrent of relatively low, but potentially hurtful magnitude, through said masses of heat softenable alloy causing them to soften to permit circuit-opening movement of said trigger.

4,559,514

CHIP TYPE FUSE HAVING CONNECTING LEGS

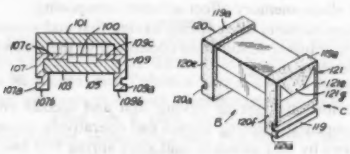
Hiroo Arikawa, Tokyo, Japan, assignor to S.O.C. Corporation, Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,689

Claims priority, application Japan, Dec. 3, 1982, 57-182601[U]

Int. Cl.[4] H01H *85/02*

U.S. Cl. 337—201 **4 Claims**



1. A chip fuse comprising a base and a cover therefor both made of a heat resistant and electrically insulating material; a pair of electrically conductive terminals having portions exposed outside of said base and ends disposed within said base in opposed relationship to one another, each of said conductive terminals having a leg portion extending below said base and each of said leg portions having a bottom face adapted to be soldered to a printed circuit board and a fusible element secured to each end of said conductive terminals inside said fuse base, wherein each of said electrically conductive terminals have hoop-like frame portions having a hole therethrough and the opposite ends of said base and cover are held, and clamped together, by said frame portions and within the said holes.

4,559,515

SLIDE TYPE VARIABLE RESISTOR ASSEMBLY AND METHOD OF PRODUCING SAME

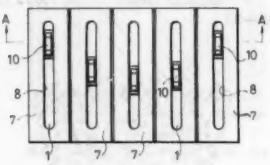
Keiji Takezawa, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 10, 1984, Ser. No. 648,887

Claims priority, application Japan, Sep. 8, 1983, 58-138436[U]

Int. Cl.[4] H01C *10/16*

U.S. Cl. 338—128 **5 Claims**



1. A slide type variable resistor assembly comprising:

a block of a synthetic resin material;

a plurality of insulation bases integrally molded in said block;

resistor means fixedly provided on a surface of each of said insulation bases;

collector means fixedly provided on the surface of each of said insulation bases;

frame means provided on each of said insulation bases; and respective slider means slidably provided between said resistor means and said frame means of each said insulation base such that said slider is slidably contacted with the respective surfaces of said resistor means and said collector means.

4,559,516

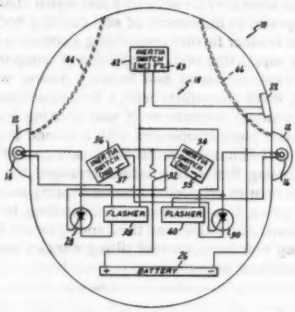
HELMET WITH TURN SIGNAL INDICATORS

Roger A. Schott, Redford, and Lawrence A. Schott, Detroit, both of Mich., assignors to Freedom Industries, Inc., Redford, Mich.

Continuation-in-part of Ser. No. 342,143, Jan. 25, 1983, abandoned. This application Sep. 23, 1983, Ser. No. 535,025

Int. Cl.[4] B60Q *1/34*; B62J *3/00*

U.S. Cl. 340—73 **10 Claims**



10. In a helmet for motorcycle riders and like applications, a turn signal indicator comprising first and second light emitting means disposed on opposite lateral sides of said helmet, first means including first inertia switch means carried by said helmet so as to be responsive to tilting of a wearer's head in one lateral direction to initiate periodic energization of the said light emitting means on one lateral side of said helmet for indicating an intent to turn in the corresponding lateral direction, and second means including second inertia switch means disposed and oriented within said helmet so as to be responsive

to tilting of the wearer's head for terminating said periodic energization.

4,559,517

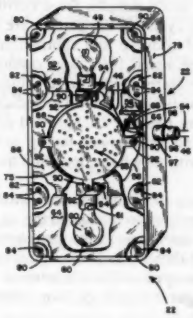
WARNING SYSTEM FOR SCHOOL BUSES

Raymond A. Rahn, 22125 Albatross, Farmington, Minn. 55024

Filed Aug. 12, 1983, Ser. No. 522,517

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—75 **4 Claims**



1. An electrical warning device for a vehicle to signal arriving and departing passengers of existing traffic conditions, comprising:

(a) an elongated open frame having two opposed open sides with each said open side covered by three panels, the first panel on each side being made of a translucent material of a first color and covering approximately one-third of said open side from one end of the elongated dimension of said frame towards the center, the second panel on each side being made from a translucent material of a color different from said first color and covering approximately one-third of said open side from the opposite end of said elongated dimension of said frame towards the center, and a third panel on each side made from an opaque material and covering the remainder of said open side, at least one of said third panels on each side having holes therethrough for transmitting acoustic energies;

(b) a first and a second electrically-powered light source contained within said frame, said first light source being positioned within said frame to show through said first translucent panels on each side and said second light source being positioned within said frame to show through said second translucent panels on each side, said second light source having an automatic circuit interrupter connected in series therewith in a first electrical series circuit; and

(c) an audible electric horn having an electric circuit interrupter connected in series circuit therewith in a second electrical series circuit and contained within said frame between said third panels, with said first and said second electrical series circuits connected together in a parallel electrical circuit; and

(d) a source of electrical power; and

(e) switch means coupling said source of electrical power alternately to said first light source or to said parallel electrical circuit.

4,559,518

SCHOOL BUS STOP SIGN AND CROSSING ARM APPARATUS

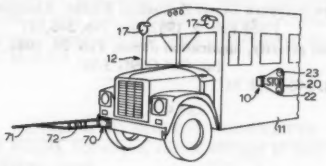
Joseph E. Latta, Jr., Hillsborough, N.C., assignor to Specialty Manufacturing Co., Charlotte, N.C.

Filed Sep. 22, 1982, Ser. No. 421,461

The portion of the term of this patent subsequent to Sep. 13, 1997, has been disclaimed.

Int. Cl.[4] B60Q *1/46*

U.S. Cl. 340—130 **10 Claims**



1. Electric battery operated apparatus for mounting and operating safety devices on a vehicle such as a school bus stop signal or crossing arm in coordination with accepting and discharging passengers and opening and closing the main entrance door on the vehicle, comprising in combination for each such safety device on the vehicle:

(a) a housing having integrally joined walls to provide a box-like internal housing cavity and means enabling said housing to be releaseably secured to an exterior mounting surface of the vehicle;

(b) a uni-directional DC motor mounted and secured within said housing;

(c) a safety device mounting and linkage arrangement including switch actuator means positioned by said motor and linkage members connected to be actuated by said motor;

(d) a safety device such as a school bus stop signal or crossing arm having an inner edge portion secured to said linkage members and adapted to being normally pivoted by said safety device mounting and linkage arrangement between a retracted position in which the safety device extends rearwardly and parallel to said mounting surface and a deployed position in which the safety device extends outwardly and perpendicular to said mounting surface;

(e) first and second normally closed limit switches mounted in opposed positions proximate said motor and switch actuation means, said first switch being arranged to be contacted by said switch actuator means when said safety device is in said deployed position and said second switch being arranged to be contacted by said switch actuator means when said safety device is in said retracted position;

(f) an electric control switch mounted on said vehicle and having first and second positions corresponding to deployment and retraction of said safety device; and

(g) relay switching means including connecting wiring enabling said motor to be connected to the vehicle battery through a first relay established path and through said second limit switch in a first circuit configuration when said control switch is moved to its said first position with said actuator means being in contact with said first limit switch and in which first circuit configuration said linkage arrangement is actuated by said motor shaft rotating in a given direction to move said safety device to said deployed position whereupon said second limit switch is electrically opened by contact with said actuator means and said battery is disconnected from said motor and enabling said motor to be connected to the vehicle battery through a second relay established path and through said first limit switch in a second circuit configuration when said control switch is moved to its said second position with said actuator means being in contact with said second limit switch and in which said second circuit configura-

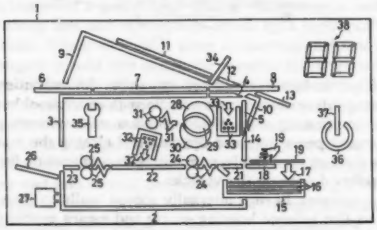
tion said linkage arrangement is actuated by said motor shaft rotating in the same said direction to move said safety device to said retracted position whereupon said first limit switch is electrically opened by contact with said actuator means and said battery is disconnected from said motor.

4,559,519

DISPLAY DEVICE FOR A COPYING MACHINE

Hiroshi Matsumoto, Yokohama; Yuji Ishikawa, Machida, and Chosin Nakamine, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 3, 1982, Ser. No. 345,547
Claims priority, application Japan, Feb. 24, 1981, 56-25659
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—286 M **6 Claims**



1. A machine (C) comprising:

an outer casing including at least one casing part (**56, 59**) which is movable to provide access to the interior of said casing;

a plurality of operating parts within said casing, each of said operating parts being susceptible of malfunction; and

a display device (**1**) outside said casing, said display device comprising:

(i) a first group of display segments (**14, 24, 25**) formed to schematically represent corresponding ones of said operating parts;

(ii) a second group of display segments (**9, 10, 34**) formed to schematically represent said at least one movable casing part; and

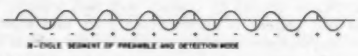
(iii) display control means (**41, 42**) coupled to said first group of display segments, said second group of display segments and said operating parts for activating a segment of said first group in response to a malfunction of the corresponding operating part and for activating segments of said second group in response to a malfunction of selected ones of said operating parts requiring said at least one movable casing part to be moved to provide access to said malfunctioning operating part.

4,559,520

METHOD FOR COMMUNICATION UTILIZING MULTI-MODE RECEPTION

Reed H. Johnston, Wellesley, Mass., assignor to New England Power Service Company, Westborough, Mass.

Filed Jun. 23, 1982, Ser. No. 391,170
Int. Cl.⁴ H04B *3/54*
U.S. Cl. 340—310 R **10 Claims**



1. A method, applicable to communicating schemes on electric powerlines wherein a single signaling event of at least one type is in principle capable of representing a binary bit, whereby one may simultaneously improve signal quality and increase data rate, the said method comprising the steps of:

(i) representing every element of digital intelligence in terms of a pattern from a selected family of orthogonal patterns, where such selected family of patterns is comprised exclusively of signaling events of the same, at least one, type and where each pattern extends over an interval corresponding to the same integer multiple of four periods of the powerline frequency, and wherein the signaling events comprising each pattern are located in exactly half of the cycles contained in said pattern, each said pattern of signaling events being impressed upon the electric powerline at a transmitting site;

(ii) for the recognition of a pattern from the selected family of orthogonal patterns, employing at the receiving site a multiplicity of simultaneous detection modes, in number equal to half the number of patterns in the selected orthogonal family, and operating in such fashion that for each detection mode samples from corresponding portions of successive cycles in the pattern are combined in an equal number of additive and subtractive operations so as to accumulate signal from, and distinguished between, the pair of patterns with which that detection mode is uniquely associated, yet fail to accumulate signal from any pre-existing periodic background or from any pattern of the selected orthogonal family other than the pair of patterns with which the detection mode is uniquely associated;

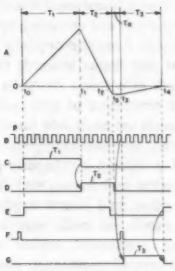
(iii) processing the signals accumulated in the various detection modes so as to recognize the, at least one, transmitted pattern, which represents the element of digital intelligence and thereby to infer each element of digital intelligence conveyed within the interval corresponding to the same integer multiple of four periods of the powerline frequency.

4,559,521

CALIBRATION OF A MULTI-SLOPE A-D CONVERTER

Eiichi Yada, Gyoda, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,459
Claims priority, application Japan, Dec. 5, 1981, 56-195973
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 NT **9 Claims**



1. A method for calibrating the m−1 multiplying factors of the count values of m integrations of m respective reference currents $I_1, I_2 \ldots I_m$ in a multi-slope A-D converter for converting an input analog signal to a digital value proportional thereto, said A-D converter including current sources for said reference currents, an integrator, switches for switching said input analog signal and reference currents to said integrator, a clock for providing clock signals to be counted and for timing said switching, a counter and computing and storage means, said reference currents being ordered by decreasing absolute magnitude and having alternating polarities, with the first reference current having the opposite polarity than said input

analog signal, said multiplying factors being for compensating for error in said digital value caused by the m−1 ratios of the reference currents varying from their nominal values, wherein the components of the A-D converter are utilized for the calibration, said method comprising

operating said switches and said counter for integrating the first reference current for a period of time corresponding to an integer number l_1 of said clock pulses, the integration beginning from a first reference level,

operating said switches and said counter for integrating the next reference current for a number n_2 of said clock pulses that is determined by the return of the output of the integrator to said first reference level,

repeating the two steps above as to each successive pair of said reference currents, starting with the second and third reference currents as the first successive pair after the first and second reference currents to yield respective count values l_2 and n_3,

utilizing said calulating and storing means for forming the multiplying factor for each said successive pair of said ordered reference currents to be $K_1=l_1/n_2=I_2/I_1$, $K_2=l_2/n_3=I_3/I_2, \ldots K_{m-1}=l_{m-1}/n_m=I_m/I_{m-1}$,

wherein said A-D converter provides the digital value of said input analog signal as being proportional to the respective sum of

$$\sum_{j=1}^{m} (-1)^{j-1} K_o \ldots K_{j-1} N_j$$

where $K_o=1$, $m=\geqq 2$ and N_j is the number of clock pulses counted in the jth integration period for the jth reference current for the A-D conversion of the respective input analog signal, each said integration period for the A-D conversion involving integrating the respective reference current for an integer number of clock pulses until a predetermined clock pulse after the integrated signal crosses said reference level.

4,559,522

LATCHED COMPARATOR CIRCUIT

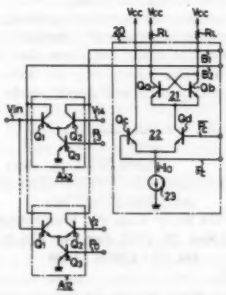
Takeo Sekino, and Masashi Takeda, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,203

Claims priority, application Japan, Dec. 24, 1982, 57-232261; Dec. 27, 1982, 57-230600

Int. Cl.⁴ H03K *13/175*

U.S. Cl. 340—347 AD **11 Claims**



1. A latched comparator circuit for use in converting an input analog signal to a digital signal to be supplied to inputs of a digital encoder, in which a voltage comparing operation and a latch operation are repeatedly carried out at every sampling period in response to a sampling signal, comprising

a plurality of voltage comparators each having first and second output terminals and each supplied with said analog input signal and one of a plurality of different reference voltages, respectively, one of said plurality of voltage comparators being enabled at every sampling period of said sampling signal and said first and second output terminals, respectively, of said voltage comparators being connected in common; and

a latch circuit having first and second input terminals respectively connected to said first and second commonly connected outputs of said plurality of voltage comparators and selectively enabled for carrying out a latch operation in response to said sampling signal, first and second output terminals of said latch circuit being respectively connected to said first and second output terminals of said voltage comparators and being connected to the inputs of said encoder.

4,559,523

ANALOG TO DIGITAL CONVERTER

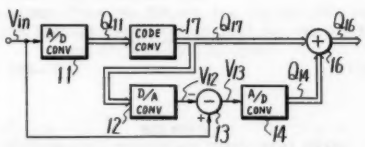
Toshiaki Wakita, Hiratsuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,213

Claims priority, application Japan, Oct. 30, 1981, 56-174167

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 AD **7 Claims**



1. An analog to digital converter for converting an input analog signal to an output digital signal having a total number of bits, comprising:

first analog to digital converter means having a predetermined error width and being operative for converting said input analog signal to a first digital signal having a first number of bits;

code converter means for converting said first digital signal to a second digital signal in accordance with said first number of bits, said total number of bits and said predetermined error width;

digital to analog converter means for converting said second digital signal to a second analog signal;

subtraction means for subtracting said second analog signal from said input analog signal and for producing an analog difference output signal;

second analog to digital converter means for converting said difference output signal of said subtraction means to a third digital signal; and

adding means for adding said second digital signal and said third digital signal to generate said output digital signal.

4,559,524

ROTARY ENCODER

Masato Suzuki, Kawasaki, Japan, assignor to Sumtak Corporation, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,466

Int. Cl.⁴ G08C *9/06;* **G01D** *5/34*

U.S. Cl. 340—347 P **4 Claims**

1. A rotary encoder comprising:

a rotary shaft;

a rotary slit disk affixed to said rotary shaft and having a plurality of slits disposed equiangularly over the entire circumference of the surface of said rotary slit disk;

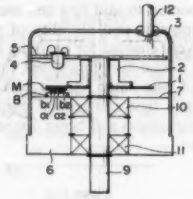
a light emitting means;

a plurality of paired detectors in which each individual detector comprises:

a photodetector opposing said light emitting means

with said rotary slit disk interposed between said photodetectors and said light emitting means;

means for coupling together the individual detectors into detector pairs and for outputting resultant pulses which have the mean phase of the combined output pulses of



each of the individual pulses of the individual detectors in each of the paired detectors such that resultant outputting pulses can be regarded as being substantially at a predetermined one point of the resultant center of all of said detector pairs.

4,559,525

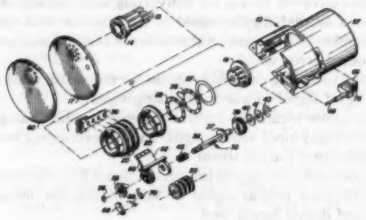
FAST INDEXING ENCODER APPARATUS

Edgar J. Abt, Tempe; Phillip D. Van Buren, Scottsdale, and James P. Witter, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 22, 1983, Ser. No. 534,872

Int. Cl.[4] G08C *9/00*

U.S. Cl. 340—347 P **9 Claims**



9. Fast indexing encoder apparatus comprising:

a plurality of rotatably mounted members each individually rotatable;

each of said members having a fixed electrical contact associated therewith;

each of said members further having an electrical wiper contact connected to said fixed contact;

a plurality of electrical conductors mounted adjacent said members for sequential engagement with the wiper contacts of each of said members as said members are rotated, said conductors being further mounted so that each wiper engages only one conductor at any time; and

selection means including a common control coupled to said plurality of members for selectively rotating any selected one of said plurality of members individually to connect the associated fixed electrical contact to a preselected one of the plurality of electrical conductors.

4,559,526

SECURITY ALARM SYSTEM

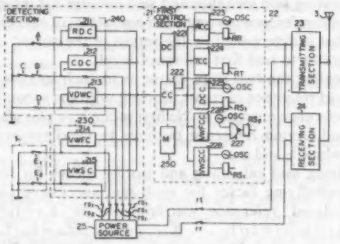
Kozaburo Tani, Kawasaki, and Tsutomu Watanabe, Fuchu, both of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,484

Claims priority, application Japan, Jun. 29, 1982, 57-110746

Int. Cl.[4] G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—539 **5 Claims**



1. A security alarm system for watching emergency situations in a predetermined guard area comprising:

a plurality of sensors for detecting the emergencies;

a transmitter-receiver for a guard area connected to said sensors and having a battery power source;

a repeater associated with said transmitter-receiver through radio;

a security controller connected to said repeater; and

a central station connected to said security controller using a transmission line and giving a guard command to an operator on the basis of emergency or ordinary data transmitted from said security controller;

means for providing a pulsating voltage from said power source for the guard area such that a predetermined pulsating voltage is applied from said battery power source to said transmitter-receiver under ordingary conditions, a predetermined voltage having a longer term than a period of said pulsating voltage is applied to a receiving section of said transmitter-receiver in response to a watch signal transmitted from said security controller via said repeater before transmitting a guard mode signal from said security controller and a predetermined voltage having a longer term than the said pulsating voltage is applied to a transmitting section of said transmitter-receiver in response to an emergency signal transmitted from said sensors at emergencies, or in response to said guard mode signal transmitted from said security controller via said repeater;

said repeater stores the emergency and ordinary data transmitted from said transmitter-receiver temporarily; and

said security controller reads out these data stored in said repeater, discriminates emergency or ordinary data, and transmits emergency data and guard mode signal to said central station.

4,559,527

DUAL MODE ELECTRONIC INTRUSION OR BURGLAR ALARM SYSTEM

Brian T. Kirby, 6434 Betsy Ross Pl., Wauwatosa, Wis. 53213

Filed Sep. 29, 1982, Ser. No. 428,392

Int. Cl.[4] G08B *13/08*

U.S. Cl. 340—545 **1 Claim**

1. In an intrusion alarm system for discouraging an intruder who observes that a first actuation for a limited time of an alarm occasioned by a first attempt at entry into secured premises fails to evoke an appropriate security response and then makes a second attempt at entry, in combination:

a plurality of components movable between open and closed positions and enabling entry into said secured premises when in open position;

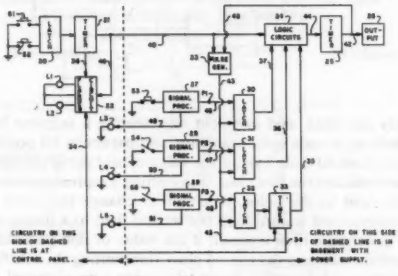
a plurality of first switch means, each actuatable by move-

ment of one of said components and having conditions corresponding to the positions of the component with which it is associated;

alarm means actuatable to provide a warning signal indicative of movement of any one of said components and observable by an intruder;

and control means, including timer means operatively connected to said plurality of said first switch means and to said alarm means and operable when any one of said first switch means is actuated from one condition to another condition to actuate said alarm for a first predetermined interval of time normally sufficient to evoke a security response, and further operable after termination of said first predetermined interval of time to again actuate said alarm for a second predetermined interval of time when said one of said first switch means is actuated from said other condition to said one condition,

said control means further including:



second switch means selectively actuatable by a non-intruder to arm said system and enable it to operate said alarm and to disarm said system and prevent it from operating said alarm;

first time delay means responsive to arming actuation of said second switch means to provide a first time delay interval during which actuation of at least a selected one of said first switch means is ineffective to cause actuation of said alarm to thereby enable a non-intruder to exit the premises after arming said system;

and second time delay means actuatable at least by said selected one of said first switch means to provide a second time delay interval after said system is armed during which said selected one of said first switch means is ineffective to cause actuation of said alarm until lapse of said second time delay interval to thereby enable a non-intruder to enter the premises and disarm said system.

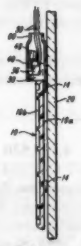
4,559,528

ORNAMENTAL VIBRATION SENSOR DEVICE FOR BURGLAR ALARM SYSTEM

Jeffrey J. Davis, New Lebanon, Ohio, assignor to Don E. Berger, Dayton, Ohio, a part interest

Filed Jul. 14, 1983, Ser. No. 513,703
Int. Cl.[4] G08B *13/02*
U.S. Cl. 340—566 **1 Claim**

1. A motion sensor device in a burglar alarm system in which a window pane is involved comprising: a translucent ornamental disc, attachment means carried by the translucent ornamental disc for attachment of the translucent ornamental disc to a window pane, a motion sending switch member, and means attaching the motion sensing switch member to the ornamental disc for operation of the motion sensing switch member with movement of the ornamental disc and with movement of a portion of the window pane, the means attaching the motion sensing switch member to the ornamental disc including a housing enclosing the motion sensing switch member, a bracket attached to the disc, an electrical socket attached to the bracket, and rigid electric conductor means removably connected within the socket and extending from the socket and



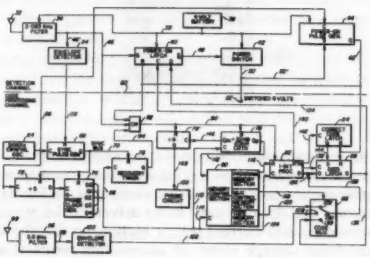
supporting the housing, the electrical conductor means being electrically connected to the motion sensing switch member.

4,559,529

ANTITHEFT SYSTEM WITH DIGITALLY CODED SIGNAL

Terry L. Bernhardt, Scottsdale, Ariz., assignor to U.S. Currency Protection Corp., Scottsdale, Ariz.

Continuation of Ser. No. 509,288, Jun. 29, 1983, Pat. No. 4,511,888. This application Apr. 15, 1985, Ser. No. 723,551
Int. Cl.[4] G08B *13/22, 13/00*
U.S. Cl. 340—571 **6 Claims**



1. A security system for detecting the removal of an article from a premises to be protected, the protected premises including at least one exit through which the article may be removed from the protected premises, said security system comprising in combination:

(A) a transmitter for transmitting at least one signal in the vicinity of said exit, said signal being transmitted as an electromagnetic radio wave of a predetermined frequency and being transmitted as a plurality of serially coded bits, said serially coded bits being transmitted by said transmitter during a corresponding plurality of successive code bit intervals;

(B) receiver means carried by said article, said receiver means including:

i. a receiver for detecting the presence of said signal, said receiver including a filter for passing signals of said predetermined frequency, said receiver being adapted to receive said serially coded bits when said article is brought into the vicinity of said exit;

ii. processing means for storing a pattern of code bits and being coupled to said receiver for comparing the serially coded bits received by said receiver with the stored code bits to determine whether they match one another, said processing means providing an output signal when said serially coded bits match the stored code bits;

iii. clocking means for providing clock signals to said

processing means to distinguish the plurality of successive code bit intervals; and

iv. alarm means electrically coupled to said processing means and responsive to said output signal for creating an alarm to assist in the recovery of the removed article; and

(C) a power supply carried by said article and electrically coupled to said receiver means for supplying electrical power thereto.

4,559,530

OVERCURRENT CONDITION DISPLAY

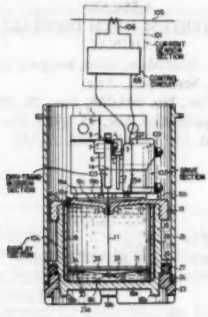
Masao Ishigure, Gifu; Mitsuo Ota, Nagoya; Naotoshi Takaoka, Inuyama, and Mitsuharu Kudomi, Konan, all of Japan, assignors to Takamatsu Electric Works, Ltd., Inuyama, Japan

Filed Oct. 5, 1982, Ser. No. 433,173

Claims priority, application Japan, Dec. 29, 1981, 56-215882; Dec. 29, 1981, 56-215883

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—664 **33 Claims**



1. An overcurrent condition display comprising

a current sensor section having a current transformer;

a drive section including a drive element and a force storage means, said drive element being driven by the overcurrent sensed by said current sensor section, to thereby actuate the force storage means to accumulate restoration force therein so that after movement of the drive element actuated by overcurrent is stopped, the drive element returns to the original position by the restoration force;

a drive-transmission section situated adjacent to the drive element, said drive-transmission section being actuated by rotation of the drive element due to the restoration force of said force storage means, said drive-transmission section automatically returning to the original position after actuation by the restoration force; and

a display section including a display tube having at least a translucent portion as viewed from below, a fluid stored in said tube and a display element connected to said drive-transmission section for vertical movement in said fluid, the overcurrent condition being display as the result of the state of said display element hoisted by said drive-transmission section, and the display of the normal state being established by said display element having descended slowly under the influence of its own gravity and the viscosity of said fluid in a predetermined time.

4,559,531

COLOR VIDEO GENERATOR

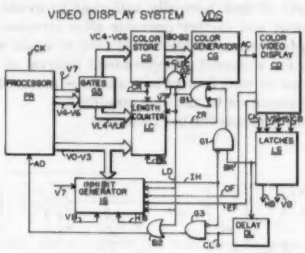
William Buynak, Bayville, N.Y., assignor to Chyron Corporation, Melville, N.Y.

Filed Feb. 14, 1983, Ser. No. 466,325

Int. Cl.⁴ G09G *1/28*

U.S. Cl. 340—703 **5 Claims**

1. In a video display system having a color display driven by a color generator for generating multicolored segments on a multiline television raster of the display, the method of controlling the color and length of the lines comprising the steps of serially generating an array of code bytes, each of said code bytes being of a first class or a second class, the class being indicated by the value of a particular bit position in the byte, each of the bytes of the first class being divided into a first field and a second field, the first field being a coded combination of bits representing a color, the second field being a coded combination of bits representing a length, the second class having



only one field, said one field representing a segment length, receiving a code byte, examining said particular bit position of said received code byte, if the value of said particular bit position indicates the first class, transmitting a representation of the first field to the color generator to change the color being displayed and transmitting the second field to a timing means to generate a time interval, if the value of said particular bit position indicates the second class, transmitting the sole field of said byte to said timing means to generate a time interval, at the end of a generated time interval, receiving the next code byte of the array.

4,559,532

X-Y POSITION INPUT DEVICE FOR DISPLAY SYSTEM

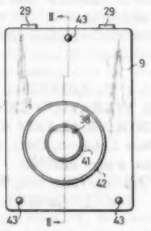
Junichi Hosogoe, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 8, 1983, Ser. No. 521,324

Claims priority, application Japan, Aug. 7, 1982, 57-119452[U]; Aug. 7, 1982, 57-119457[U]; Aug. 7, 1982, 57-119460[U]

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—710 **5 Claims**



1. An X-Y input device comprising a rotatable ball, a first driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, a second driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, said second driven roller having an axis of rotation extending substantially perpendicularly to that of said first driven roller, first angle detector means for detecting an angle of rotation of said first driven roller, second angle detector means for detecting an angle of rotation of said second driven roller, and a casing

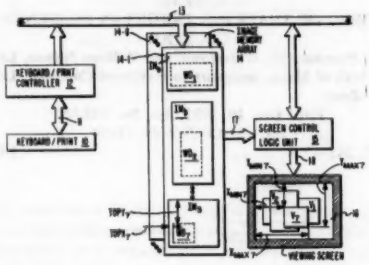
housing said rotatable ball, said first and second driven rollers, and said first and second angle detector means, said casing having a lower opening with said rotatable ball partly projecting downwardly therethrough for rolling movement on a base, said casing having at least one rejector projection having a free outer end on a lower surface thereof for rejecting foreign matter on said base to prevent said foreign matter from reaching said ball, said projection being integral with the casing at said lower surface and being an annular shape surrounding said opening in said casing, wherein the said free outer end of said projection and the contact point of said ball with said base are essentially in the same plane when the case is moved.

4,559,533

METHOD OF ELECTRONICALLY MOVING PORTIONS OF SEVERAL DIFFERENT IMAGES ON A CRT SCREEN

Leland J. Bass; Roy F. Quick, Jr., both of San Diego; Ashwin V. Shah, Encinitas, and Ralph O. Wickwire, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 3, 1983, Ser. No. 548,551
Int. Cl.⁴ G09G *1/00*
U.S. Cl. 340—724 **10 Claims**



1. A method of electronically displaying and moving portions of several different images on a screen; including the steps of:

storing control signals in a first memory which partition said screen into an array of blocks and define several overlapping prioritized viewports on said screen by specifying which of said blocks are included in each viewport;

correlating each viewport to a portion of a respective one of said images by associating a set of parameters IW, TOPX, TOPY, Xmin, Ymin and N with each viewport where IW defines a width in blocks of said viewport, BA defines a base address for said image which is correlated to said viewport, TOPX and TOPY define a position of said viewport relative to said image which said viewport is correlated to, Xmin and Ymin define a position of said viewport on said screen, and N defines a number of lines within each block;

storing in a second memory, a respective set of two numbers IW and BA+(TOPY)(IW)(N)+TOPX—Xmin—(Ymin)-(IW)(N) for each viewport;

determining, from said signals in said first memory, which of said viewports in a particular block has a priority that is higher than that of any other viewport in said particular block;

forming, from said numbers in said second memory, an address for several adjacent pixels in one line of said image that is correlated to said viewport as determined by said determining step;

reading said adjacent pixels at the address formed by said forming step and transferring those same pixles to said screen for display;

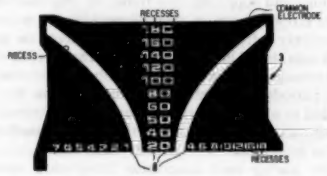
repeating the determining, forming and reading steps for all of said lines in all of the blocks in said array.

4,559,534

DISPLAY DEVICE WITH LEGENDS FORMED INTEGRALLY WITH ELECTRODE STRUCTURE

Friedrich-Wilhelm Nickol, Eppstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,657
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142101
Int. Cl.⁴ G09G *3/18*
U.S. Cl. 340—754 **9 Claims**



1. In a display device, a cell comprising:

an electrode assembly consisting of only two opposed electrode structures,

a liquid-crystal substance arranged between said two opposed electrode structures,

a first of said electrode structures being divided into a plurality of selectively activatable adjacent display electrodes arranged to form bar graphs while the other of said electrode structures is formed as a common electrode, and is positioned opposite said display electrodes as a common electrode, and wherein

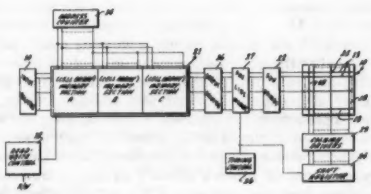
one of said opposed electrodes structures has recesses which form a fixed display pattern, each of said recesses being formed directly within an electrode of one of said electrode structures, individual ones of said recesses being in registration with corresponding ones of said display electrodes such that a symbol provided by a recess appears to an observer to be within a corresponding display electrode image upon activation of the corresponding display electrode.

4,559,535

SYSTEM FOR DISPLAYING INFORMATION WITH MULTIPLE SHADES OF A COLOR ON A THIN-FILM EL MATRIX DISPLAY PANEL

Randy W. Watkins, Sun Valley; Robert J. Bell, Moorpark; Joseph A. Martorano, Studio City, and Walter F. Essinger, Thousand Oaks, all of Calif., assignors to Sigmatron Nova, Inc., Thousand Oaks, Calif.

Filed Jul. 12, 1982, Ser. No. 397,127
Int. Cl.⁴ G09G *3/30*
U.S. Cl. 340—793 **10 Claims**



1. A system for displaying information with multiple shades of a color on a thin-film EL display panel having a two-coordinate array of picture elements, said system comprising:

drive circuit means associated with said display panel for

scanning and selectively refreshing the picture elements thereof with a frame of data during a frame time period;

a plurality of memory sections, each memory section having a two-coordinate array of memory cells;

each memory section having a memory cell corresponding to each picture element on the panel;

input means for storing a different frame of data into each of said memory sections, a number of the memory sections having data stored in the memory cells thereof corresponding to each picture element on the panel defining the shade of said picture element; and

reading means for successively reading each of said memory sections and supplying the frame of data therein to said drive circuit means to thereby provide for scanning and selectively refreshing the picture elements on said panel with data stored in corresponding memory cells of each of said memory sections during a number of successive frame time periods, the number of successive frame time periods needed to so scan and refresh the picture elements on said panel with data from each of the memory sections defining an integration time period;

whereby during each successive integration time period each picture element on the panel is refreshed a number of times as determined by the number of memory sections having data stored in the memory cells thereof corresponding to said picture element to thereby vary the shade with which the picture elements are viewed by an eye of an observer.

4,559,536

DATA TRANSMISSION DEVICE

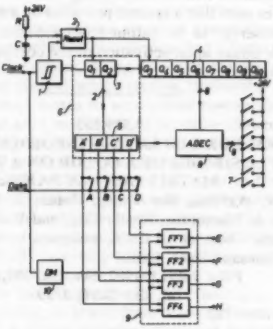
Lykke Olesen, Granve,uml/a/ gen 4, S-130 40 Djurhamn, and Bo Lindgren, Musserongängen 285, S-135 34 Tyresö, both of Sweden

Filed Jan. 19, 1983, Ser. No. 459,085

Claims priority, application Sweden, Jan. 19, 1982, 8200269

Int. Cl.[4] H04Q *9/00*; **G08B** *19/00*; **G06F** *3/04*

U.S. Cl. 340—825.07 **8 Claims**



1. Data transmission device, comprising a plurality of monitor units (U_1, U_2 . . .), which are connected in parallel to a computer (CC) and which, during a working cycle, are activated one after the other by the emission of clock pulses from the computer, said clock pulses being counted in an address counter (4) disposed in each unit, said address counter, upon reaching a predetermined (7) count value, securing that sensed information is transmitted to the computer, each monitor unit (U_1, U_2) being connected to the computer (CC) via at least two connections, one of which ("clock") serving to transmit said clock pulses from the computer (CC) and the other ("data") serving to transmit sensed data information from the particular monitor unit (U_1, U_2 . . .), characterized in that each monitor unit comprises:

a binary counter (3), the input of which is coupled to the clock pulse connection ("clock") and the output of which is connected to a functional decoder (5), so that the clock pulses will cyclically increment said functional decoder (5);

an address counter (4), the input of which is coupled to the clock pulse connection so as to be incremented each time said binary counter (3) starts a new counting cycle and the output of which (4) is connected via an address decoder (8) to said functional decoder (5) so as to activate the latter upon reaching said predetermined count value of the address counter (4);

switching means including a plurality of switches (A, B, C, D) coupled between a respective output of said functional decoder (5) and said data transmission connection ("data") for representing by open or closed states of said switches, a sensed bit of information of a plurality of bits of information;

whereby, when said functional decoder (5) is activated upon reaching said predetermined count value of the particular monitor unit, a pulse train representing sensed information is emitted in sequence at the data transmission connection ("data") substantially in synchronism with the clock pulses received at the clock pulse connection ("clock").

4,559,537

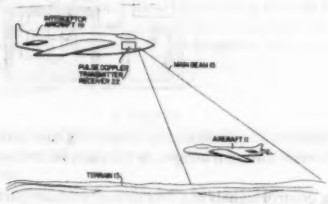
METHOD OF TRACKING TARGET IN PRESENCE OF CLUTTER

Earl C. Pearson, Jr., Watertown, and William Nelson, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 10, 1982, Ser. No. 448,863

Int. Cl.[4] G01S *7/46, 13/04*

U.S. Cl. 343—7 A **1 Claim**



1. In the operation of a pulse Doppler radar responsive to clutter and a target wherein a frequency tracking loop is incorporated, such loop including an oscillator operating at an adjustable frequency to provide a frequency tracking capability whereby only target return signals are tracked, the method of generating a control signal for the oscillator, such method comprising the steps of:

(a) forming, from all signal returns received during a predetermined period of time, a range/Doppler matrix having N×M cells, where N equals the number of range bins and M equals the number of Doppler bins at each range, a digital one in any one of the cells indicating a return signal and a digital zero indicating absence of a return signal;

(b) sequentially reading, in accordance with a predetermined program, the content of each one of the cells successively to form digital numbers from 4 M sequentially read cells, each digit in each one of such digital numbers being indicative of the presence, or absence, of reutrn signals in four successive range bins;

(c) comparing each five successively formed digits with a five digit reference digital number having a digital one as the center digit and a digital zero as the first and fifth digits to produce a gating signal only when the first, center and fifth of five successively formed digits in the successively formed digital numbers correspond with the five digit reference digital number;

(d) generating, in synchronism with each successively formed digital number, a frequency control signal representative of the Doppler frequency of a selected cell; and

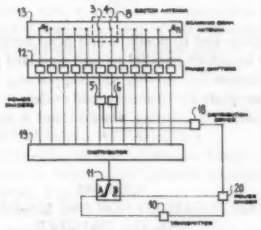
(e) passing the frequency control signal extant with the gating signal to the oscillator to control the frequency thereof.

4,559,538

MICROWAVE LANDING SYSTEM WITH PROTECTION AGAINST JAMMING

Joseph Hetyei, and Bruno Letocquart, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 13, 1982, Ser. No. 417,250
Claims priority, application France, Dec. 13, 1981, 81 24576
Int. Cl.⁴ H01Q *3/22*; G01S *1/16*
U.S. Cl. 343—412 **8 Claims**



1. A microwave landing system comprising two ground stations, transmitting respectively angular messages of azimuth and elevation, each angular message being constituted by a preamble followed by an angular function, each station comprising:

a sector antenna transmitting said preamble of said angular function;

a scanning beam antenna transmitting said angular function and having a gain higher that the sector antenna gain;

means for superimposing, in phase, the radiation pattern of said sector antenna and the radiation pattern of said scanning beam antenna, the latter pointed in a predetermined direction during the entire transmission of said preamble and the superposition of radiation patterns occurring successively in several chosen directions which in their entirety cover the complete sector radiation pattern, so as to reinforce the gain, in a given sector, of the sector radiation pattern of said sector antenna with regards to the normal gain of said sector pattern.

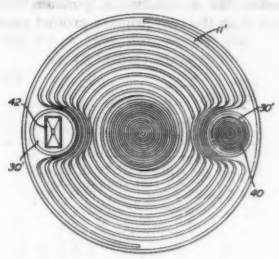
4,559,539

SPIRAL ANTENNA DEFORMED TO RECEIVE ANOTHER ANTENNA

Raymond S. Markowitz, Wyncote; Baruch Even-Or, and Walter Bohlman, both of Chalfont, all of Pa., assignors to American Electronic Laboratories, Inc., Landsdale, Pa.

Filed Jul. 18, 1983, Ser. No. 514,763
Int. Cl.⁴ H01Q *1/36*
U.S. Cl. 343—725 **24 Claims**

1. An antenna comprising at least one radiating element wound in a generally spiral pattern, said radiating element departing from said spiral pattern and curving radially inward toward the center of said spiral pattern in at least one region so as to define at least one void only partially bound by said



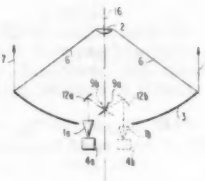
radiating element at said region, said void being adapted to receive another antenna.

4,559,540

ANTENNA SYSTEM WITH PLURAL HORN FEEDS

Shinichi Betsudan; Katsuhiko Aoki; Shigeru Sato, all of Hyogo, and Takashi Katagi, Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 583,509, Feb. 24, 1984, abandoned, which is a division of Ser. No. 296,024, Aug. 25, 1981, Pat. No. 4,462,034. This application Jun. 17, 1985, Ser. No. 744,898
Claims priority, application Japan, Aug. 28, 1980, 55-119988
Int. Cl.⁴ H01Q *19/14*
U.S. Cl. 343—761 **3 Claims**



1. In an antenna system of the type which is used for a plurality of frequency bands, said antenna system comprising a main reflector (3) having an axis of symmetry, a subreflector (2) rotationally symmetric with respect to said axis, a group of horns (1*a*, 1*b*) used for plural frequency bands, and at least two focusing reflectors (9*a*, 12*a*, 9*b* and 12*b*) for eliminating cross-polarization produced by one of said horns and said subreflector, said horns being arranged on the circumference of a circle having a center on said axis of symmetry with one of said focusing reflectors being arranged on said axis of symmetry, to thereby constitute a beam waveguide system for the plural bands.

4,559,541

LOG-PERIODIC LEAKY TRANSMISSION LINE ANTENNA

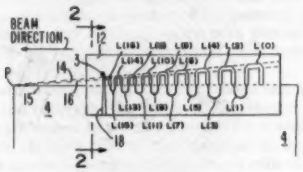
Charles W. Westerman, El Toro, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Aug. 19, 1983, Ser. No. 524,637
Int. Cl.⁴ H01Q *11/10*
U.S. Cl. 343—792.5 **7 Claims**

1. A log-periodic antenna comprising:

a planar, electrically conductive non-radiating portion substantially parallel to, sandwiched between, and electrically insulating from two substantially parallel electrically conductive primary ground planes; and

a planar, electrically conductive radiating portion coplanar and contiguous with the non-radiating portion, protruding from the sandwich comprising the two primary ground planes and the non-radiating portion, and electrically insulated from the two primary ground planes;



wherein the radiating and non-radiating portions comprise one continuous conductor having alternating radiating and non-radiating loops, wherein the loop sizes decrease monotonically in the direction of radiation emanation, and the width of each non-radiating loop is less than the width of each contiguous radiating loop.

4,559,542

THERMAL PRINTING HEAD

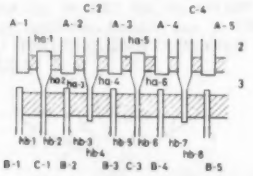
Tsunemasa Mita, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,338

Claims priority, application Japan, Jun. 7, 1982, 57-97171

Int. Cl.[4] H05B *3/00*

U.S. Cl. 346—76 PH **6 Claims**



1. A thermal printing head for multi-tone or multicolor image reproduction comprising:

a plurality of heating resistors disposed closely to each other along a path parallel to the direction of scanning, each of said plurality of heating resistors having different heating characteristics and being divided into a plurality of heating elements; and electricity supplying means for selectively and individually supplying electricity to any combination of said heating elements of said heating resistors so as to provide any desired combination of heat states of said heating element.

4,559,543

INK JET RECORDING DEVICE MODULAR FRAME

Shigeo Toganoh; Yohji Matsufuji, and Hiroo Ichihashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,409

Claims priority, application Japan, Oct. 13, 1981, 56-163653; Oct. 13, 1981, 56-163636; Oct. 14, 1981, 56-163715

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **12 Claims**

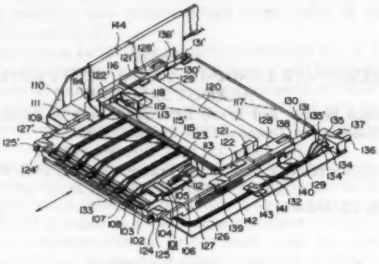
1. Recording apparatus comprising:

a base plate;

a supporting plate movably mounted to said base plate;

a plurality of ink jet devices removably mounted to said supporting plate, each said device having a head portion with a number of outlets adapted to discharge ink disposed at predetermined locations defining respective ink discharging planes;

a front plate mounted to said supporting plate and defining a standard plane, said front plate having notches for accepting said head portions and cooperating therewith to provide alignment of said ink discharging planes in said standard plane and to position said head portions in predetermined locations parallel to said standard plane; and



moving means for moving said supporting plate relative to said base plate for orienting said outlets in any of a recording position, a capping position and a maintenance position.

4,559,544

MULTI-NOZZLE HEAD FOR INK ON-DEMAND TYPE INK JET PRINTER

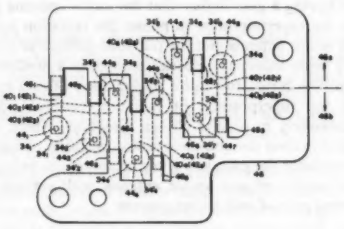
Shuzo Matsumoto, Yokohama; Takuro Isayama; Hiroshi Yamazaki, both of Tokyo, and Yasuo Katano, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,418

Claims priority, application Japan, Apr. 14, 1983, 58-56017; Apr. 14, 1983, 58-56018; Apr. 20, 1983, 58-69358; Apr. 20, 1983, 58-69357

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **15 Claims**



1. In a multi-nozzle head for an ink jet printer having a signal supply section for generating a displacement which corresponds to an information signal to be printed out, and an ink ejecting section for ejecting ink drops from a predetermined number of nozzles in response to the displacement, said ink ejecting section comprising:

(a) a flat head base; and

(b) said predetermined number of ink compressing chambers formed in said head base to supply ink to the nozzles respectively, said ink compressing chambers being arranged such that the ink compressing chambers are divided into a plurality of groups and said groups are respectively positioned on a plurality of imaginary lines which are individually inclined at predetermined angle with respect to an intended direction of ejection of ink drops from the nozzles;

the ink ejecting section further comprising flat resilient

vibration members each constituting part of a wall which closes any of the ink compressing chambers associated therewith, and vibrating in response to the displacement imparted from the signal supply section;

the signal supply section comprising (c) elongate flat vibration units in a number which is equal to the number of the ink compressing chambers, and (d) a support member for supporting said vibration units at one portion of the vibration units such that the other end of each of the vibration units coincides with a position of any of the ink compressing chambers associated with said vibration unit;

the support member supporting the vibration units such that the vibration units lie in a common plane and extend in two opposing directions;

each of the vibration units comprising an electrostrictive vibrator displacable in response to the information signal to be printed out, a vibration plate integral with said electrostrictive vibrator and vibrating in response to the displacement, said electrostrictive vibrator and vibration plate being spaced from and extending parallel to the support member, and a vibration transmitting rod for transmitting the vibration to any of the ink compressing chambers associated with the vibration unit.

4,559,545

RECORDING APPARATUS

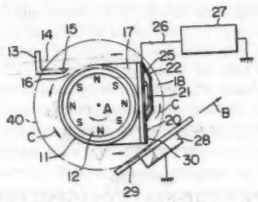
Shigeru Iemura, Kawasaki, and Akira Kawano, Yokohama, both of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,523

Claims priority, application Japan, Dec. 7, 1982, 57-215306; Dec. 7, 1982, 57-215307

Int. Cl.⁴ G01D *15/06*

U.S. Cl. 346—155 **8 Claims**



1. A recording apparatus having:

a rear electrode;

a hollow member of a non-magnetic material, said hollow member and said rear electrode being spaced from one another by a predetermined gap;

a magnet rotatably housed in said hollow member;

a driving device for rotating said magnet;

means for supplying a magnetic toner onto the outer peripheral surface of said hollow member;

a recording head attached on the outer peripheral side of said hollow member and housed, together with said hollow member, within a magnetic field produced by said magnet; and

means for feeding a recording medium through the gap between said recording head and said rear electrode;

wherein said recording head comprises:

a rigid board of an insulating non-magnetic material attached on the outer peripheral side of said hollow member;

recording electrode patterns formed on said rigid board and arranged to face said rear electrode; and

a voltage pulse applying circuit mounted on said rigid board and adapted to selectively apply voltage pulses to said recording electrode patterns.

4,559,546

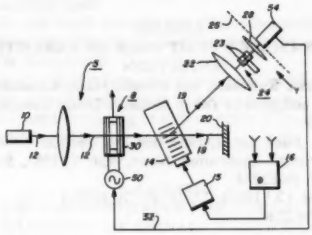
INTENSITY CONTROL FOR THE IMAGING BEAM OF A RASTER SCANNER

Kwok-leung Yip, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,284

Int. Cl.⁴ G01D *15/14*

U.S. Cl. 346—160 **10 Claims**



1. In a raster output scanner employing a polarized beam for scanning a recording member, modulator means for modulating the beam in response to an image signal input, and scanning means for scanning the beam across the recording member, the improvement comprising:

beam polarization rotating means astride the path of said beam for rotating the plane in which said scanning beam is polarized to control the diffraction efficiency of said modulator means and control beam intensity at said recording member.

4,559,547

SEMICONDUCTOR DEVICE

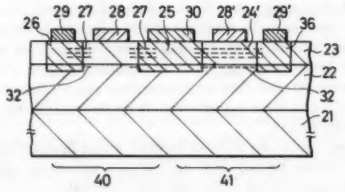
Yasuhiro Shiraki, Hino; Yoshimasa Murayama, Koganei; Yoshifumi Katayama, Tokorozawa, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,233

Claims priority, application Japan, Nov. 27, 1981, 56-189339

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.2 **21 Claims**



1. A semiconductor device comprising:

a semiconductor substrate,

a first semiconductor layer and a second semiconductor layer formed over said substrate, said first and second semiconductor layers forming a hetero-junction at an interface between them,

said first semiconductor layer having a relatively small forbidden band gap as compared with that of said second semiconductor layer,

at least one pair of electrodes connected electronically to said first semiconductor layer,

and gate means for controlling carriers in said first semiconductor layer, said gate means being located over the first and second semiconductor layers,

wherein said device further includes first and second regions in

said first and second semiconductor layers, with substantially no impurities being included in said first region, said first region being located in said first and second semiconductor layers under said gate means, and with impurities included in said second region, said second region being located in said first and second semiconductor layers adjacent to said at least one pair of electrodes.

4,559,548

CMOS CHARGE PUMP FREE OF PARASITIC INJECTION

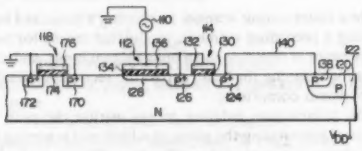
Tetsuya Iizuka, Kawasaki, and Hisashi Hara, Kamakura, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 2, 1982, Ser. No. 364,639

Claims priority, application Japan, Apr. 7, 1981, 56-52032; Apr. 7, 1981, 56-52033

Int. Cl.⁴ H01L *27/04, 29/78;* **H02M** *7/19*

U.S. Cl. 357—23.6 **9 Claims**



1. A substrate bias generator comprising:

a semiconductor substrate;

a first semiconductor region of a first conductivity type existing in said semiconductor substrate, said semiconductor region supplied with a first potential;

a capacitive element formed in said first semiconductor region, said capacitive element including a second semiconductor region as a first electrode and a conductive means formed on said second semiconductor region as a second electrode with an insulation film interposed therebetween;

a MOS transistor formed in said first semiconductor region serving as a first rectifying element, said MOS transistor including source and drain regions of a second conductivity type so as to establish a PN junction between said semiconductor region and said source and drain regions, said MOS transistor further including a gate electrode formed on said first semiconductor region between said source and drain regions with an insulation film interposed therebetween;

a second rectifying element formed in said first semiconductor region having first and second terminals, said first terminal supplied with a second potential;

a third semiconductor region of the second conductivity type existing in said semiconductor substrate, in which circuit elements are formed;

voltage supply means for supplying an AC voltage to one of said first and second electrodes of said capacitive element;

first means for connecting together the other one of said first and second electrodes of said capacitive element, said gate electrode of said MOS transistor, one of said source and drain regions of said MOS transistor, and said second terminal of said rectifying element;

second means for connecting said third semiconductor region to the other one of said source and drain regions of said MOS transistor, whereby said PN junction formed between said first semiconductor region and said source and drain regions is reversebiased during operation of said substrate bias generator.

4,559,549

DATA STORAGE DEVICES WITH VERTICAL CHARGE TRANSFER

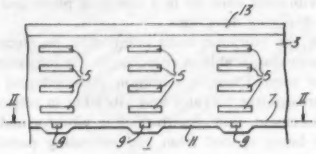
Derek H. Roberts, Buckingham, and Michael Pepper, Cambridge, both of England, assignors to The General Electric Company, p.l.c., England

Filed Aug. 18, 1982, Ser. No. 409,128

Claims priority, application United Kingdom, Aug. 21, 1981, 8125615; Jul. 26, 1982, 8221791

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—24 **4 Claims**



1. A data storage device associated with a planar integrated circuit, the storage device comprising:

(a) a body of discrete electric charge storage material formed on a face of said planar integrated circuit;

(b) within said body, a plurality of spaced discrete columns of spaced discrete electric charge storage sites, the columns extending in directions normal to the plane of said planar integrated circuit and;

(c) control means on the side of said body remote from said integrated circuit, said control means being connected with said integrated circuit such that, under the control of potentials applied to said control means by said integrated circuit, electric charge may be injected into a said storage site adjacent said control means in a selected said column, and such that each charge in a storage site in a selected said column may be transferred to the next adjacent site in the column in a direction towards the integrated circuit, and in the case of a charge in the storage site of said selected column adjacent said integrated circuit, be transferred to an element of said integrated circuit, thereby to provide access to said storage sites.

4,559,550

CCD TYPE SOLID-STATE IMAGING DEVICE

Norio Koike, Tokyo; Shinya Ohba, Kanagawa, and Toshiaki Masuhara, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 548,576

Claims priority, application Japan, Nov. 8, 1982, 57-195815

Int. Cl.⁴ H01L *29/78, 27/14, 31/00;* **G11C** *19/28*

U.S. Cl. 357—24 **6 Claims**

1. A solid-state imaging device, comprising:

a number of photodiodes disposed in a two-dimensional regular array;

a plurality of vertical CCD shift registers for transferring photogenerated signal charge packets produced by a first series of said photodiodes;

a plurality of vertical shift registers for transferring photogenerated signal charge packets produced by a second series of said photodiodes;

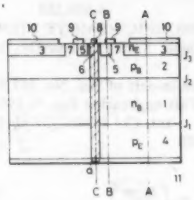
a single horizontal CCD shift register for transferring output charge packets of said vertical CCD shift registers to an output circuit; and

a coupling circuit disposed between said vertical CCD shift registers and said horizontal CCD shift register, wherein said coupling circuit transfers the signal charge packets of the first and second series outputted from the adjacent two of said vertical CCD shift registers, respectively, beneath storage electrodes of said horizontal CCD shift register alternately on the time-serial basis.

4,559,551
SEMICONDUCTOR DEVICE

Tsutomu Nakagawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 334,336, Dec. 24, 1981. This application Sep. 17, 1984, Ser. No. 651,138
Claims priority, application Japan, Dec. 25, 1980, 55-188811
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 3 Claims

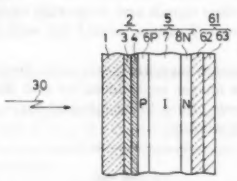


1. A semiconductor device having a major surface, a first emitter region of first conductivity type disposed from said major surface into a first base layer of second conductivity type, an auxiliary emitter region of first conductivity type disposed from said major surface into said first base layer, a second base layer of first conductivity type having a first impurity concentration, and a second emitter region of second conductivity type, wherein the first base layer has a gate region extending to the major surface characterized in that a dopant of heavy metal impurities having a concentration higher than said first impurity concentration of said second base layer and above approximately $2.5\times10^{13}/cm^3$ is selectively diffused in a particular region which is extended from said major surface through said gate region and through the first base layer, the second base layer, and the second emitter region, but not through the first emitter region or auxiliary emitter region, to make the specific resistance of said second base layer inside said particular region higher than the specific resistance of said second base layer outside said particular region.

4,559,552
PIN SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE WITH TWO OXIDE LAYERS

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,703
Claims priority, application Japan, May 24, 1982, 57-87800
Int. Cl.[4] H01L *29/12*
U.S. Cl. 357—58 18 Claims



1. A PIN semiconductor photoelectric conversion device comprising:

a laminated member including at least a first conductivity type first non-single-crystal semiconductor layer forming a first major surface of the laminated member, an I-type second non-single-crystal semiconductor layer, and a second conductivity type third non-single-crystal semiconductor layer forming a second major surface of the laminated member;

a light transparent first electrode making ohmic contact with the first non-single-crystal semiconductor layer through which light enters in the laminated member; and

a reflective second electrode formed on the third non-single-crystal semiconductor layer to make ohmic contact therewith;

wherein the reflective second electrode has a light transparent conductive metal oxide layer formed on the third non-single-crystal semiconductor layer and a reflective conductive metal layer formed on the light transparent conductive layer;

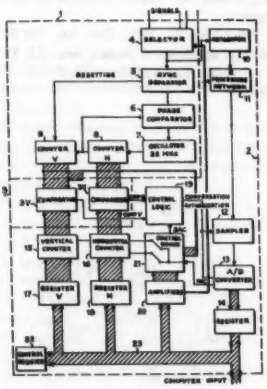
wherein the third non-single-crystal semiconductor layer contains phosphorus as an N-conductive type impurity and is N-type; and

wherein the light transparent conductive metal oxide layer of the reflective electrode is made of indium oxide or a metal oxide consisting of indium oxide containing 1 to 10 weight percent of other materials.

4,559,553
DEVICE AND APPARATUS FOR THE SELECTIVE ACQUISITION OF SIGNALS, PARTICULARLY TELEVISION SIGNALS, WITH A VIEW TO THEIR CHARACTERIZATION BY A DIGITAL COMPUTER

Luc P. van Cang, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 16, 1983, Ser. No. 475,971
Claims priority, application France, Mar. 19, 1982, 82 04753
Int. Cl.[4] H04N *9/62*
U.S. Cl. 358—10 3 Claims



1. Apparatus for the selective acquisition of television signals representing in each case a luminance and chrominance state of a point of a television image and for providing information as to said signal to a digital computer comprising:

a current address generator constituted by a first counter advancing at the timing of the sampling times of the current point being scanned in said image in order to give the address of the current point on a television image scanning line and a second counter advancing with the timing of the television signal line sync. Signals in order to give the line address of the current point of said scanned image;

a sampling unit for sampling the television signals inputed into said apparatus, incorporating a first register for storing the address of the point of the line to be sampled and a second register for storing the line address of the point to be sampled, which are respectively coupled to a first and second programmable counters which can be respectively loaded by the content of first and second storage registers of the point to be sampled;

a comparison device comprising;

a first comparator connected at a first input to the first

counter of said current address generator and connected at a second input to the output of the first programmable counter of said sampling unit,

a second comparator connected to the second counter of the current address generator and connected to the second counter of the current address generator and connected to the second programmable counter of the sampling unit in order to detect equality between the address of the current point and the address of the desired point contained in the first and second programmable counters and to provide an authorization signal;

a means coupled to said comparison device and said sampler unit for controlling said sampler unit in accordance with said authorization signal provided by said comparison device;

an analog to digital converter having a conversion cycle and being coupled to said sampling unit for converting the amplitude of the sample generated by the sampling unit into a digital quantity and for supplying signals for the incrementation, by one unit, the content of the first and second programmable counters at the end of each conversion cycle;

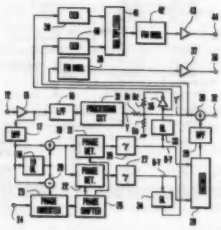
and a control device, controlled by said computer and addressed by the current address in order to supply programmed control signals to the sampling unit.

4,559,554

COLOR TELEVISION CAMERA WITH A SINGLE IMAGE PICKUP TUBE FEATURING IMPROVED RENDITION OF BRIGHT MONOCHROMATIC OBJECTS

Yoshiro Nitta, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,507
Claims priority, application Japan, Sep. 22, 1982, 57-165885
Int. Cl.⁴ H04N *9/07, 5/14*
U.S. Cl. 358—44 **6 Claims**



1. A color television camera having a single image pickup tube including a photoconductive layer and filter means disposed on said photoconductive layer for forming on said photoconductive layer a color separated image in accordance with the color components of an object to be televised, said color television camera comprising:

means for generating an electric signal corresponding to said image;

first separating means for separating a luminance signal from said electric signal;

second separating means for separating a chrominance signal from said electric signal;

demodulating means for demodulating a plurality of color difference signals from said chrominance signal, including at least a red color difference signal;

mixing means for mixing said luminance signal with at least said red color difference signal, said red color difference signal having a level thereof adjusted by said mixing means by multiplication of said level by a predetermined ratio and having a polarity thereof inverted relative to said luminance signal such that a level adjusted red color difference signal is subtracted from said luminance signal to provide a corrected luminance signal; and

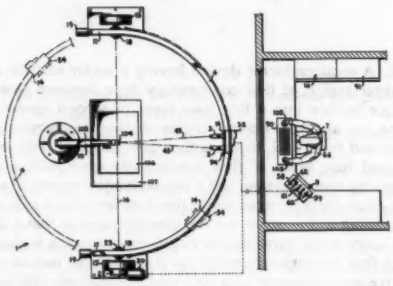
encoding means supplied with said plurality of color difference signals and said corrected luminance signal from said mixing means for generating a composite color video signal.

4,559,555

STEREOSCOPIC REMOTE VIEWING SYSTEM

Arnold Schoolman, 8705 Catalina Dr., Prairie Village, Kans. 66207

Continuation-in-part of Ser. No. 351,917, Feb. 24, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,385
Int. Cl.⁴ H04N *13/00, 7/18*
U.S. Cl. 358—88 **14 Claims**



1. A stereoscopic remote viewing system comprising:

(a) a pair of spaced apart image sensor means providing a left video signal and a right video signal, said video signals representing scenes as sensed by said image sensor means;

(b) camera platform means having said image sensor means mounted thereon for convergence of lines of sight of said sensor means substantially at a subject to be viewed;

(c) camera platform aiming means supporting said platform means for movement in three dimensions to selectively aim said image sensor means;

(d) platform aiming motor means connected with said aiming means to move said aiming means;

(e) aiming control motor means connected to said motor means for manipulation by a viewer using said viewing system to aim said camera platform means;

(f) a pair of video display devices operatively connected respectively to said image sensor means to receive said left and right video signals and displaying images which are reproductions of scenes sensed by said image sensor means; and

(g) head unit means supporting said video display devices for viewing the images reproduced by said display devices, said head unit means being adapted for wearing on the head by said viewer.

4,559,556

SYSTEM FOR VIEWING THREE DIMENSIONAL IMAGES

Vaughn D. Wilkins, 19163 Olympia St., Northridge, Calif. 91326

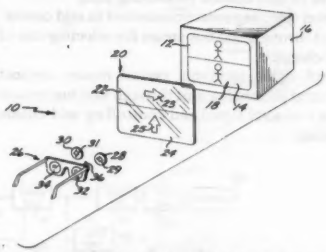
Continuation-in-part of Ser. No. 550,137, Nov. 9, 1983, abandoned. This application Dec. 14, 1984, Ser. No. 681,932
Int. Cl.⁴ H04N *9/54*
U.S. Cl. 358—88 **22 Claims**

1. A viewing system for viewing images displayed in two dimensions on a viewing screen with a three-dimensional effect, comprising:

a pair of polarizing filters disposed between the viewing

screen and a viewer for polarizing on different axes light from a respective pair of slightly different images of a common subject displayed on the viewing screen; and

a pair of eyeglasses having a pair of lens openings for respective placement in front of the right and left eyes of the viewer, a pair of polarizing lenses respectively covering the lens openings and oriented generally upon axes con-



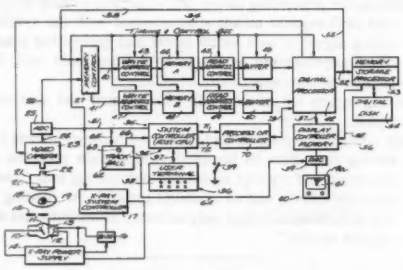
forming respectively with said polarizing filters whereby the viewer's right and left eyes will observe different ones of the pair of images, image shifting and magnification lens means respectively covering the lens openings, and means for adjusting said image shifting lens means for displacing the observed images into a viewer-perceived superimposed relation forming a composite image having a three-dimensional appearance.

4,559,557

REGION-OF-INTEREST DIGITAL SUBTRACTION ANGIOGRAPHY

Gary S. Keyes, Hartland; Barry F. Belanger, Milwaukee, and Anne L. Hall, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,206
Int. Cl.⁴ G06F *15/42;* **H04N** *5/32*
U.S. Cl. 358—111 **8 Claims**



1. A digital subtraction angiography method comprising the steps of:

forming a temporal subtraction image of an anatomical region and storing the digital signal values corresponding to the intensities of the picture elements (pixels) composing said image,

converting said digital signal values to analog video signals for effecting display of the temporal subtraction image on a video monitor,

forming a hybrid subtraction image and storing the digital signal values corresponding to the intensities of the pixels composing said hybrid subtraction image,

defining in said temporal subtraction image a region or regions in which the values of the pixel signals are to be replaced by the values of the corresponding pixel signals in a corresponding region or regions, respectively, in said hybrid image,

inserting the digital pixel signal values from said region or regions of said hybrid image in place of the corresponding pixel signal value in said stored temporal subtraction image, and

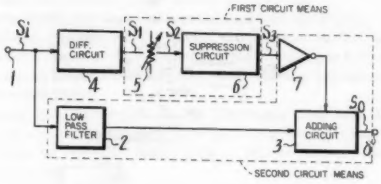
converting the digital pixel signals representative of the resulting combined image to analog video signals for effecting display of the resulting image on the video monitor.

4,559,558

PICTURE QUALITY ADJUSTING CIRCUIT

Mitsuru Hosoya; Takao Tsuchiya, both of Fujisawa, and Naokuni Toyoda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP81/00408, § 371 Date Aug. 24, 1982, § 102(e) Date Aug. 24, 1982, PCT Pub. No. WO82/02312, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 25, 1981, Ser. No. 413,378
Claims priority, application Japan, Dec. 26, 1980, 55-186495
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—162 **4 Claims**



1. Video picture quality adjusting apparatus comprising:

means for twice differentiating an input video signal to form a correcting signal,

first circuit means responsive to said correcting signal and including suppression means for limiting the maximum amplitude of said correcting signal to produce a modified correcting signal, and

second circuit means jointly responsive to said modified correcting signal and said input video signal to produce a corrected output video signal;

wherein said suppression means comprises

an input terminal, capacitor means, resistor means and an output terminal in series with each other, and

a DC voltage source and diode means in series with each other and in parallel with said resistor means and capacitor means,

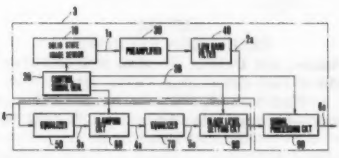
whereby said diode means becomes conductive when the voltage of said correcting signal bears a predetermined relationship to that of said voltage source.

4,559,559

NOISE REDUCING CIRCUIT

Seiji Hashimoto, and Nobuyoshi Tanaka, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 389,053
Int. Cl.⁴ H04N *5/21, 5/18;* **H04B** *1/10, 15/00*
U.S. Cl. 358—167 **16 Claims**



1. A noise reducing circuit, comprising:

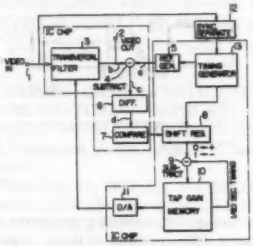
(a) a clamping circuit to clamp signals;
(b) a first circuit, being provided at an input side of said clamping circuit and having such characteristic as having an attenuating characteristic at least at a first frequency constituting the upper limit frequency of noises which can be reduced by said clamping circuit; and
(c) a second circuit, being provided at an output side of said clamping circuit and having a characteristic to emphasize the output signal of the clamping circuit, at least said first frequency thereof.

4,559,560

GHOST REDUCTION CIRCUIT FOR A TELEVISION RECEIVER

Toshinori Murata; Yuji Ito, both of Yokohama, and Masafumi Kazumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,424
Claims priority, application Japan, Oct. 20, 1982, 57-182821
Int. Cl.⁴ H04N *5/21*
U.S. Cl. 358—167 **8 Claims**



1. A ghost reduction apparatus for a television receiver, comprising: a transversal filter; a tap gain memory for storing tap gains of tap amplifiers included in said transversal filter; detecting means for detecting as an error signal a ghost component contained in a video signal passed through said transversal filter by comparing a first predetermined reference signal contained in said video signal with a second reference signal produced in association with said first reference signal; converting means for converting a differentiated output signal derived from said error signal through differentiation into a digital signal; and correcting means for correcting the tap gain data stored in said tap gain memory in accordance with said digital signal,

wherein said means for converting said differentiated output signal into the digital signal includes a first comparator having an input supplied with said differentiated output signal, a second comparator having an input supplied with an inverted signal of said differentiated output signal and an arithmetic circuit for processing arithmetically the output signals of said first and second comparators,

said ghost component being substantially reduced from said video signal passed through said transversal filter by controlling the gains of the individual tap amplifiers included in said transversal filter in accordance with the corrected data read out from said tap gain memory.

4,559,561

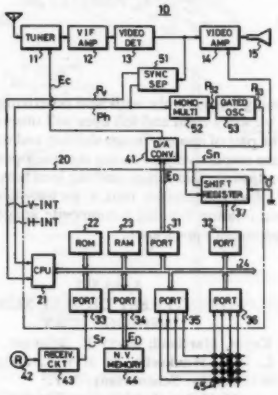
TELEVISION RECEIVER

Toshio Amano, and Daisuke Kozakai, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,182
Claims priority, application Japan, Nov. 30, 1982, 57-209880
Int. Cl.⁴ H04N *5/50*
U.S. Cl. 358—192.1 **4 Claims**

1. A television receiver for receiving a video signal that includes a synchronizing signal, said receiver comprising:

a central processing unit having an interrupt function;
bus means connected to said central processing unit;
read only memory means connected to said central processing unit through said bus means and containing a control program to be executed by said central processing unit;
random access memory means connected to said central processing unit through said bus means and used as a work area of said central processing unit;
channel selecting means connected to said central processing unit through said bus means for selecting one of a plurality of channels;
control signal receiving circuit means connected to said central processing unit through said bus means for receiving a control signal and controlling said channel selecting means;



shift register means connected to said central processing unit through said bus means;

clock pulse generating means for supplying a clock pulse to said shift register means synchronized with the synchronizing signal of said video signal and generating a serial signal representing a character pattern from said shift register means; and

mixing means for mixing said video signal and said serial signal;

said control program in said read only memory means containing font data to be displayed, a main program for decoding said control signal and controlling said channel selecting means, and an interrupt program for loading the font data from said read only memory means into said shift register means.

4,559,562

MICRODEFLECTOR FACET TRACKER FOR SCANNING SYSTEM

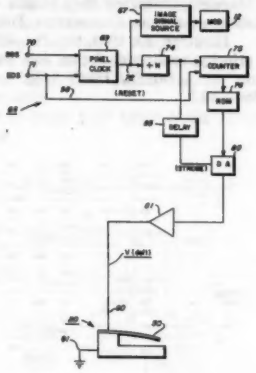
Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 16, 1983, Ser. No. 523,982
Int. Cl.⁴ H04N *1/04, 1/29, 3/08*
U.S. Cl. 358—208 **7 Claims**

7. A facet tracker for use in tracking a beam of high intensity radiation to maintain the point where the beam impinges on the facets of a rotating scanning element substantially constant, comprising:

(a) a generally rectangular base having a recess; and
(b) an elongated flexible reflector element projecting above said recess for reflecting said beam, said recess permitting said reflector element to bend on application of an electrical potential thereto so that by applying controlled electrical potentials to the reflector element, the point at which

the beam impinges on the scanning element facets may be displaced concurrently with movement of the facets



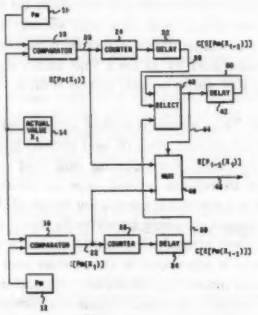
whereby the beam is tracked and held in substantially constant location on the scanning element facets.

4,559,563

ADAPTIVE PREDICTION FOR BINARY ENCODED DOCUMENTS CONTAINING A MIXTURE OF TEXT, LINE DRAWINGS AND HALFTONES

Ronald E. Joiner, Jr., Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 11, 1983, Ser. No. 540,950
Int. Cl.[4] H04N *1/00, 7/12, 1/40*
U.S. Cl. 358—260 **13 Claims**



1. A system for adaptively predicting a block of image data comprising:

a plurality of predictors, each using a different predictor pattern for predicting the data bits of each image data block,

a comparator for each predictor for generating an error code representative of the accuracy of the predictions made,

selector means for selecting one of the predictors, based on its performance on one or several previous data blocks, and

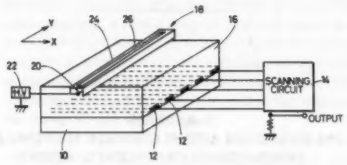
means responsive to the output of said selector means for outputting the error code for the current block using the selected predictor.

4,559,564

TWO-DIMENSIONAL IMAGE READER

Masataka Itoh, Tenri, and Shohichi Katoh, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1984, Ser. No. 581,131
Claims priority, application Japan, Feb. 21, 1983, 58-28072; May 25, 1983, 58-93651
Int. Cl.[4] H04N *1/02*
U.S. Cl. 358—293 **14 Claims**



1. A two-dimensional image reader comprising:

a photoconductive layer of a predetermined thickness,

said photoconductive layer having a first major surface and a second major surface opposed to said first major surface, each major surface having a preselected size extended in two-dimensions;

charging means extended in one dimension over said first major surface of said photoconductive layer so as to apply charges on said first major surface of said photoconductive layer;

optical exposure means disposed above said first major surface of said photoconductive layer, said optical exposure means being extended along said charging means;

shift means for shifting said charging means and said optical exposure means in the other dimension with respect to said photoconductive layer; and

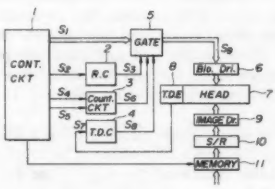
detection electrode means secured to said second major surface of said photoconductive layer so as to develop a detection electric signal representative of an optical image applied by said optical exposure means.

4,559,565

THERMOSENSITIVE RECORDING SYSTEM

Shigeru Katsuragi, Hiratsuka; Kunio Hakkaku, and Mutsuo Ogawa, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 279,544, Jul. 1, 1981, abandoned. This application Dec. 1, 1983, Ser. No. 557,374
Claims priority, application Japan, Jul. 1, 1980, 55-88483
Int. Cl.[4] H04N *1/22*
U.S. Cl. 358—296 **5 Claims**



1. A thermosensitive recording system for recording serial one-dimensional image signals obtained by scanning a two-dimensional image, by a heat-emitting recording head and a thermosensitive sheet, said recording system comprising:

temperature-detection means for detecting the temperature of said heat-emitting head; and

recording-density-changing means for changing the record-

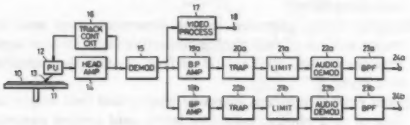
ing density of the images obtained by recording said serial one-dimensional image signals in the subscanning direction, said recording density being decreased in the subscanning direction by controlling said recording-density-changing means in accordance with detection signals from the temperature-detection means as the temperature of said heat-emitting head is elevated.

4,559,566

FM DEMODULATING CIRCUIT HAVING AN INSENSITIVE FREQUENCY POINT

Kazuyuki Suenaga, Noda, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 21, 1981, Ser. No. 332,882
Claims priority, application Japan, Dec. 22, 1980, 55-181573
Int. Cl.[4] H04N *5/76*; G11B *3/74*
U.S. Cl. 358—342 **6 Claims**



1. An FM demodulating circuit for demodulating a plurality of frequency modulated signals, said FM demodulating circuit comprising:

input means for receiving at least first and second frequency modulated signals, said first and second frequency modulated signals being independent from each other;

a first demodulator circuit coupled to said input means for demodulating first predetermined signals from said input means, said first predetermined signals including said first frequency modulated signal and said second frequency modulated signal with said second frequency modulated signal appearing as a first crosstalk component in said first frequency modulated signal, said first frequency modulated signal being demodulated in said first demodulator circuit; and

output terminal means coupled to an output of said first demodulator circuit for producing a demodulated output of said first demodulator circuit;

said first demodulator circuit comprising first circuit meand coupled to said input means, first capacitor means coupled to said circuit means, and first inductor means coupled to said circuit means and said capacitor means, said first capacitor means and said first inductor means including a parallel-connected circuit comprising a capacitor and a coil,

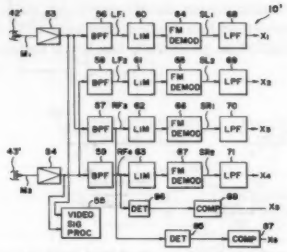
said first demodulator circuit having a first demodulating output frequency characteristic in which a first differential value describing the slope of the first demodulating output frequency characteristic curve reaches a maximum at a frequency which is approximately equal to a center frequency of said first frequency modulated signal and reaches a minimum at a frequency which is approximately equal to a center frequency of said second frequency modulated signal, so that the amplitude of the demodulated output of said first crosstalk component is negligible as compared to the amplitude of the demodulated output of said first frequency modulated signal.

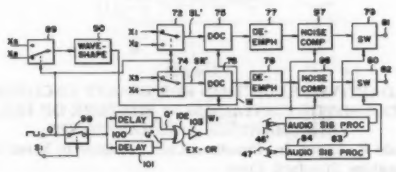
4,559,567

APPARATUS FOR RECORDING AND/OR REPRODUCING VIDEO AND AUDIO SIGNALS

Takanori Maruichi, Chiba, and Shoji Hagita, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 13, 1983, Ser. No. 457,747
Claims priority, application Japan, Jan. 16, 1982, 57-5264
Int. Cl.[4] H04N *5/783*
U.S. Cl. 360—10.3 **48 Claims**





1. An apparatus for reproducing video and audio signals recorded as first and second mixed signals in successive alternately arranged adjacent first and second parallel record tracks, respectively, extending obliquely on a magnetic record tape, and in which said first and second mixed signals are comprised of respective carriers of different frequencies frequency modulated by at least one audio signal to constitute respective FM audio signals mixed with a video signal, comprising:

magnetic head means scanning substantially along adjacent first and second ones of said record tracks in succession for alternately reproducing said first and second mixed signals therefrom as said tape is advanced at a normal speed in a normal reproducing mode of the apparatus, said head means scanning imperfectly along said record tracks in another reproducing mode of the apparatus in which the tape is advanced at other than said normal speed so that said mixed signals are reproduced with noise particularly when said head means are situated adjacent end portions of the record tracks being imperfectly scanned thereby;

means for separating said FM audio signals from the respective reproduced mixed signals;

frequency-demodulating means receiving the FM audio signals separated from said reproduced mixed signals and demodulating therefrom respective alternately reproduced portions of said audio signal;

combining means for sequentially combining said alternately reproduced portions of the audio signal into a reconstituted audio signal; and

means operative for removing from said reconstituted audio signal said noise which is reproduced with said mixed signals in said other reproducing mode.

4,559,568

APPARATUS FOR RE-RECORDING A DIGITAL SIGNAL ON A RECORD MEDIUM AND FOR REPRODUCING THE SAME THEREFROM

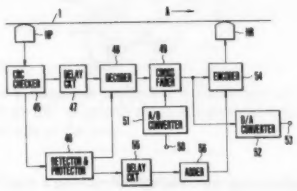
Tetsu Watanabe, and Masato Tanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,129

Claims priority, application Japan, Jan. 19, 1982, 57-6328; Jan. 19, 1982, 57-6329

Int. Cl.⁴ G11B *5/09;* **G06F** *11/00, 11/10*

U.S. Cl. 360—48 **12 Claims**



1. Apparatus for recording digital signals on a track on a magnetic record medium and for reproducing said digital signals therefrom, wherein during a first recording operation a first digital signal may be recorded on said track and during a second operation thereafter a second digital signal may be recorded on said track to replace said recorded first digital signal, said apparatus comprising:

code generating means for generating respective discriminating code signals in association with said first and second digital signals, respectively;

recording means for recording a selected one of said first and second digital signals and its respective discriminating code signal on said track to constitute a recorded selected digital signal;

reproducing means for reproducing any digital signals and their respective discriminating code signals from said track; and

error identifying means responsive to the reproduced discriminating code signals for identifying an error condition when a digital signal other than said recorded selected digital signal is reproduced from said track, and for generating a detection signal thereupon;

said first and second digital signals consisting of consecutive data blocks organized in sets of n data blocks, said code generating means supplying the same discriminating code signal to all data blocks within each of said sets, and said error identifying means identifying said error condition when the reproduced discriminating code signals for n successively reproduced data blocks are not all identical; and

wherein said discriminating code signal is the same for all of said sets of data blocks within each said digital signal.

4,559,569

CIRCUIT ARRANGEMENT FOR CORRECTING FREQUENCY RESPONSE IN ACCORDANCE WITH FREQUENCY RESPONSE OF A SOUND FIELD

Zenju Otsuki, Kawasaki, and Mamoru Inami, Yokohama, both of Japan, assignors to Thomson-Brandt, Paris, France

Filed Mar. 8, 1984, Ser. No. 587,485

Claims priority, application Japan, Mar. 8, 1983, 58-38033; Mar. 8, 1983, 58-33316[U]

Int. Cl.⁴ G11B *5/45, 5/02*

U.S. Cl. 360—65 **14 Claims**

1. A circuit arrangement for automatically giving a frequency response to an input audio signal, comprising:

(a) a reference signal generator for producing a reference audio signal;

(b) a selector for selecting said reference audio signal or said input audio signal from a signal source, said selector being controlled such that said reference audio signal is selected until a desired frequency response is given thereto;

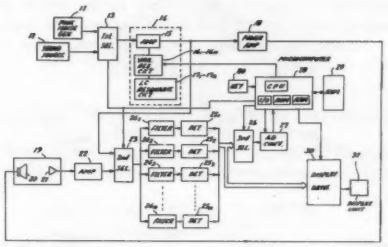
(c) a frequency response control circuit responsive to a control signal for giving a given frequency response to an audio signal from said selector such that the level of said audio signal is controlled at n bands wherein n is a positive integer, said frequency response control circuit including:

an amplifier responsive to said audio signal from said selector, said amplifier having a negative feedback path;

a plurality of variable resistor circuits whose number is 2n, each of said variable resistor circuits having a parallel circuit of a plurality of series circuits of a resistor and an analog switch, a first group of n of said variable resistor circuits being connected to said negative feedback path to cause a loop gain of said amplifier to increase, and a second group of n of said variable resistor circuits being connected to said amplifier to cause the attenuation of the level of said audio signal;

a plurality of resonance circuits whose number is n, having different center frequencies within an audio frequency range, each of said resonance circuits being connected to two of said variable resistor circuits respectively belonging to said first and second groups;

an interface circuit responsive to said control signal for controlling on-off operation of said analog switches of said variable resistor circuits, said interface circuit having a shift register of serial-in, parallel-out type for receiving said control signal by shifting serial data in response to a clock pulse signal, a decoder responsive to



some bits of parallel outputs from said shift register for producing a latching pulse to select one of said n bands, n latches arranged to be enabled by said latching pulse so that one of said n latches is used to store some of said bits of the parallel outputs from said shift register so as to control on-off operations of said analog switches of one of said variable resistor circuits corresponding to a designated band, and first means responsive to a timing signal and to one of said parallel outputs from said shift register for causing said decoder to output said latching pulse;

(d) a power amplifier responsive to an output signal from said frequency response control circuit for driving a loud speaker so that said audio signal passed through said frequency response control circuit is emitted to a sound field;

(e) second means responsive to an output signal from a microphone located in said sound field for picking up said audio signal, for analyzing frequency response at said n bands and for producing digital data indicative of a signal level at each of said n bands;

(f) storage means for storing digital data indicative of a plurality of frequency response curves; and

(g) computing means responsive to said digital data from said second means and to said digital data from said storage means;

for computing the difference in signal level between said two digital data at each of said bands;

for producing said control signal by using the difference between said two digital data, said control signal includ-

ing a first digital data word including information for designating one of said bands, and a second digital data word including information for designating signal level in each of said bands, said first and second digital data words having a serial format so that said first and second digital data words are fed to said interface circuit of said frequency response control circuit via a single line, said first and second digital data words including one bit indicating that the digital data word is either said first or second digital data word; and

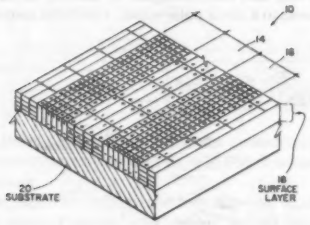
for producing said timing signal which will be used by said interface circuit for detecting said one bit for distinguishing said first digital data word from said second digital data word.

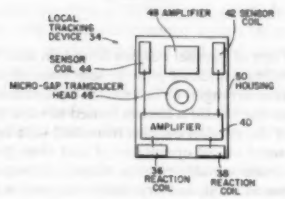
4,559,570

MAGNETIC STORAGE SYSTEM

David M. Schwartz, Denver, Colo., assignor to CompuSonics Corporation, Englewood, Colo.

Filed May 14, 1984, Ser. No. 609,765
Int. Cl.[4] G11B *5/58*
U.S. Cl. 360—77 **24 Claims**





24. An apparatus for storing magnetic data comprising:

dual planar magnetic disk storage means having a plurality of magnetized wall regions having a predetermined direction of polarity and a plurality of data tracks disposed between said wall regions;

magnetic head assembly means for recording and retrieving said magnetic data on said data tracks comprising:

magnetic transducer means for reading and writing said magnetic data on said data tracks with a direction of polarity substantially normal to the direction of polarity of said magnetized wall regions;

sensor coil means for sensing the location of magnetic transducer means with respect to said magnetized wall regions;

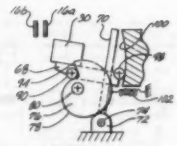
reaction coil means for producing a reaction coil magnetic field to adjust the position of said magnetic transducer means in response to the position of said magnetic transducer means sensed by said sensor coil means.

4,559,571

TAPE CARTRIDGE DRIVE WITH MOVABLE READ/WRITE HEAD

Dennis R. Olmsted, San Diego, and Eric S. Stevens, El Cajon, both of Calif., assignors to Data Electronics, Inc., San Diego, Calif.

Filed Nov. 26, 1982, Ser. No. 444,834
Int. Cl.[4] G11B *21/02, 15/54*
U.S. Cl. 360—105 **14 Claims**



1. A head-moving mechanism for moving a read/write head of a tape drive into and out of contact with a tape in a tape cartridge mounted in the tape drive adjacent the head, the tape having at least a generally elongated portion extending along a path at a preselected elevation within the tape drive, the head being movable between an operative position in contact with the tape and a retracted position out of contact with the tape at an elevation spaced from the elevation of the tape, the head-moving mechanism comprising: a support for the read/write head; an elongated guide arm; means for pivoting the guide arm toward or away from the tape, a portion of the guide arm being secured to the pivoting means so the guide arm pivots about an axis transverse thereto at an elevation spaced from the elevation of the tape, an elongated free end portion of the guide arm extending from the pivot axis toward the elevation of the tape while being spaced laterally from the tape to swing about the pivot axis through an arc toward or away from the tape; means for slidably mounting the head support on the guide arm so the head support and head can travel along the free end portion of the guide arm toward or away from the elevation of the tape; and means for controlling pivotal movement of the guide arm about its transverse pivot axis in coordination with sliding travel of the head support along the guide arm for (1) moving the head into said operative position by causing the head support to slide along the guide arm to move the head toward the elevation of the tape while pivoting the guide arm about its pivot axis through an arc toward the tape and for (2) causing the guide arm to pivot through an arc away from the tape while the head support slides alon the guide arm away from the elevation of the tape to move the tape head to the retracted position.

4,559,572

MAGNETIC HEAD AND METHOD OF FABRICATING SAME

Noriyuki Kumasaka, Ome; Hideo Fujiwara, Tokorozawa; Shigekazu Otomo, Sayama; Takeo Yamashita, Hachioji; Shinji Takayama, Mitaka; Noritoshi Saito, Hachioji; Nobuo Kobayashi, Kokubunji, and Mitsuhiro Kudo, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

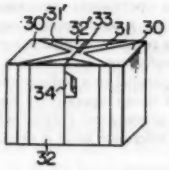
Filed Jan. 31, 1984, Ser. No. 575,704
Claims priority, application Japan, Feb. 4, 1983, 58-16067
Int. Cl.[4] G11B *5/12*
U.S. Cl. 360—110 **6 Claims**

1. A magnetic head comprising:

a pair of core protection materials each of which is made of non-magnetic material and has a tapered portion defining a ridge, said core protection materials being arranged so that tips of the ridges of said tapered portions are facing towards each other; and

a pair of V-shaped magnetic films which are respectively, formed on surfaces of the ridges of said pair of core pro-

tection materials, said V-shaped magnetic films being arranged adjacent to one another to form a non-magnetic gap which has substantially the same width as a recording



track of a magnetic recording medium and which is not parallel to the magnetic films at edges of said magnetic films except at the gap.

4,559,573

MAGNETO-OPTICAL RECORDING MEDIUM

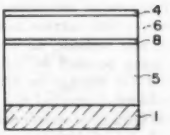
Shinsuke Tanaka, Kamakura; Fujio Tanaka, Tokyo; Yasuyuki Nagao, Hoya; Nobutake Imamura, Tokyo, and Chuichi Ota, Fuchu, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1982, Ser. No. 440,299

Claims priority, application Japan, Nov. 10, 1981, 56-178971

Int. Cl.⁴ G11B *23/00*

U.S. Cl. 360—131 **7 Claims**



1. A magneto-optical memory medium comprising: a substrate, a magneto-optical readout medium layer having an easy axis of magnetization perpendicular to its surface and provided on said substrate, a reflector medium layer adjacent to and in contact with said readout medium layer, and a magneto-optical recording medium layer having an easy axis of magnetization perpendicular to its surface and provided adjacent to and in contact with the reflector medium layer, the reflector medium layer having good thermal and electrical conduction characteristics so that when light is applied for information reproduction, the light passes through said readout medium layer to said reflector medium layer and is reflected back to said readout medium layer for use in enhancing an optically reproduced output.

4,559,574

TAPE CASSETTE

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

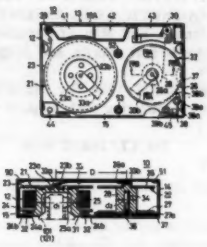
Continuation of Ser. No. 322,766, Nov. 19, 1981, abandoned. This application Nov. 1, 1984, Ser. No. 667,382

Claims priority, application Japan, Nov. 25, 1980, 55-96693[U]; Nov. 25, 1980, 55-167532[U]; Aug. 13, 1981, 56-119403[U]

Int. Cl.⁴ G11B *23/04*

U.S. Cl. 360—132 **15 Claims**

1. A tape cassette comprising a case having a base plate, a supply reel having a relatively large diameter hub and flange means, coupling means formed in the bottom center of said large diameter hub, a take-up reel having a relatively small diameter hub and flange means with a center hole therein, said supply and take-up reels being positioned inside said case in a side-by-side relationship with a tape path extending therebetween, an upstanding shaft mounted on and fixed to said base plate for receiving said center hole and rotatably supporting said take-up reel, said coupling means being positioned over an opening in said base plate for receiving a driving shaft of a recording/reproducing apparatus, said driving shaft supporting and rotating the supply reel in said cassette responsive to power supplied from said apparatus through said driving shaft



to said coupling means, said take-up reel further having meshing means formed around at least the periphery of said flange means for meshing with a driving meshing means in said apparatus to rotate said take-up reel responsive to power supplied from said apparatus through said driving meshing means to the meshing means formed around the periphery of said flange means, said meshing means and said driving meshing means meshing with each other in a side-by-side relationship.

4,559,575

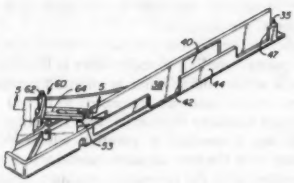
REMOVABLE DISK CARTRIDGE WITH IMPROVED DOOR OPERATING MECHANISM

Sal J. Noto, Cupertino, and Robert P. Wartenbergh, Woodside, both of Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed Nov. 22, 1982, Ser. No. 443,770

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—133 **4 Claims**



1. A door slide mechanism for a disk cartridge having a top and bottom casing portion with door slide grooves provided adjacent an access end, said mechanism comprising:

a pair of bored bosses each formed on a different inner surface of said top and bottom casing portions in spaced faced relation;

a door slide received in said slide grooves, said door slide having a free end and an operated end;

a crank having a central body portion with coaxially arranged first and second journal means serving as pivot posts, the first journal means having a sufficiently longer axial length than the second journal means for providing a vertically stable support for said crank when received in the bored boss of the bottom casing portion during assembly, said crank having a first operating arm coupled to said operated end of said door slide and a second operating arm arranged at an angle with respect to said first operat-

ing arm and adapted to rotate said crank in a first angular direction when operated by an associated member; and

a torsion spring received about said bored boss of said bottom casing portion and held in tension by a fixed reference provided by one of said top and bottom casing portions and a reference stop carried by said crank.

4,559,576

PROTECTION DEVICE FOR A SUPERCONDUCTING MAGNETIC COIL ASSEMBLY

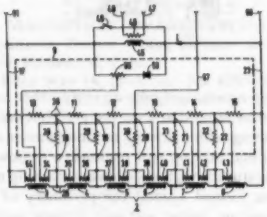
Günter Ries, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,783

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303449

Int. Cl.⁴ H02H *9/00*

U.S. Cl. 361—19 **15 Claims**



1. In a device for the protection of a superconducting magnetic coil assembly that is to be cryogenically cooled by a liquid coolant, when there is an unintended transition from the superconducting state to the normal conducting state, in which the magnetic coil assembly is subdivided into several partial winding sections that are connected one after another, with each of which a protective resistor with a predetermined ohmic value is connected in parallel in so that the ends of adjacent partial winding sections that face one another are connected to the corresponding ends of their respective protective resistors by a common section of an electrical conductor, the improvement wherein:

(a) the protective resistors are located in a exhaust gas stream of the coolant;

(b) in each section of the conductor that is common to adjacent partial winding sections there is located an auxiliary resistor whose ohmic value is smaller than that of each of the protective resistors connected to it; and

(c) to each auxiliary resistance, two electrical heating elements are connected in parallel, which are in thermal contact with the two adjacent partial windings which are connected with the respective auxiliary resistor.

4,559,577

DRILLING MACHINE

Michihiro Shoji, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,247

Claims priority, application Japan, Apr. 5, 1982, 57-56305

Int. Cl.⁴ H02H *7/085;* **B23B** *47/24*

U.S. Cl. 361—31 **5 Claims**

1. A portable drilling machine detachably and magnetically fixed to a huge mass of workpiece comprising in combination:

a frame;

an electric drill mounted on said frame in a linearly movable manner and having an electric driving motor;

an electromagnetic base integrally attached to a lower portion of said frame for fixing the same to said huge mass of workpiece;

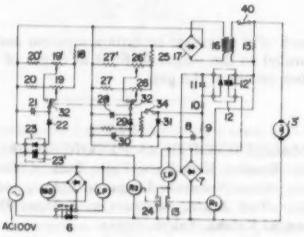
a starting switch which combines a control switch of said electromagnetic base with a control switch for said electric drill;

a manual feed handle for moving said electric drill toward and away from said huge mass of workpiece;

a control circuit for said electric drill;

sensor means operatively connected in said control circuit for detecting a load applied on said electric drill, and including a resistor coupled in series to said electric motor and a transformer, said resistor being operatively connected in parallel to a voltage rectifier;

alarm means being operatively connected in said control circuit for sending out a signal when a load signal exceeding a first reference level is detected; and



switch means being operatively connected in said control circuit for deenergizing said control circuit for said electric drill when a load signal exceeding a second reference level is detected; wherein an increase in load on said electric driving motor increases the current through said electric motor which current increases a potential difference across said resistor, an increase in said potential difference being boosted by said transformer and converted into a d.c. voltage by said rectifier, said voltage being operatively connected to a second resistor to produce a signal voltage proportionally distributed by a variable resistor being operatively connected to a first capacitor, said signal voltage above said first reference level flows through a constant-voltage diode to activate said alarm means.

4,559,578

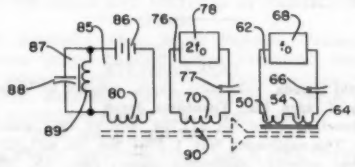
DUAL APERTURE DIPOLE MAGNET WITH SECOND HARMONIC COMPONENT

Walter F. Praeg, Palos Park, Ill., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 31, 1983, Ser. No. 528,278

Int. Cl.⁴ H01F *7/20*

U.S. Cl. 361—139 **18 Claims**



1. In a dual-aperture dipole magnet comprising:

a magnetic core having first and second spaced-apart magnetic flux gaps formed therein, said magnetic core carrying magnetic flux which crosses said first and said second flux gaps, said magnetic core further having first and second end sections and a central section positioned therebetween;

a central, a first end, a second end coil cavity formed in said central, first end, and said second end sections of said core

respectively, for receiving a plurality of windings of electric coils which set up a plurality of magnetic fluxes which are carried by said magnetic core and which cross said flux gaps;

a plurality of magnetizing windings disposed in said central, first end, and second end coil cavities;

first-harmonic generating means for energizing said magnetizing windings with a sine wave of a fundamental frequency, so as to set up a magnetic flux of a fundamental frequency in said first and said second flux gaps;

wherein the improvement comprises:

second frequency generating means for energizing said magnetizing windings with a sine wave of twice the fundamental frequency, so as to set up a magnetic flux of a second-harmonic frequency in said first and said second flux gaps;

a direct current generating means for energizing said magnetizing windings so as to set up a unidirectional magnetic flux in said first and said second flux gaps;

phase control means for controlling the electrical phases of said windings of said plurality of magnetizing windings, such that in each of said first and said second flux gaps, at least two different-frequency magnetic fluxes combine so as to form resultant cyclic waveforms having a first cyclic portion of a first frequency and a second cyclic portion of a second higher frequency, said first and said second cyclic portions forming a continuous cycle of electromagnet operation in said first and said second flux gaps, respectively.

4,559,579

DEVICE FOR THE PROTECTION OF AN ELECTRONIC COMPONENT AND/OR CIRCUIT AGAINST THE DISTURBANCES (VOLTAGES) GENERATED BY AN EXTERNAL ELECTROMAGNETIC FIELD

Christian Val, St. Remy les Chevreuses, France, assignor to Thomson CSF, Paris, France

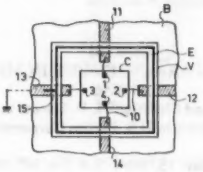
PCT No. PCT/FR83/00091, § 371 Date Jan. 3, 1984, § 102(e) Date Jan. 3, 1984, PCT Pub. No. WO83/04157, PCT Pub. Date Nov. 24, 1983

PCT Filed May 10, 1983, Ser. No. 571,554

Claims priority, application France, May 14, 1982, 82 08489

Int. Cl.⁴ H02H *3/20*

U.S. Cl. 361—220 **10 Claims**



1. A device for the protection of an electronic device against an external electromagnetic field, said electronic device having output and input connections, said protection device comprising electrical connection means, said connection means comprising a first material and a second material said first material having an electrical conductivity which increases under the action of said external electromagnetic field, said second material being electrically conductive and being positioned on to said first material, said connection means being positioned between and in contact with, by means of said first material, each of said connections of said electronic device and a ground or a store for charges produced by said field.

4,559,580

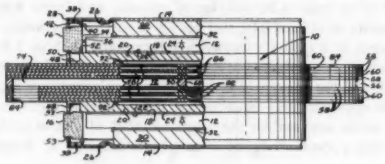
SEMICONDUCTOR PACKAGE WITH INTERNAL HEAT EXCHANGER

Gary J. Lutfy, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 4, 1983, Ser. No. 549,208

Int. Cl.⁴ H05H *7/20*

U.S. Cl. 361—385 **4 Claims**



1. A semiconductor package with internal heat exchanger comprising:

a wafer-like semiconductor body having at least two electrical elements; one at a relatively flat surface of said body;

a wall of high electrical and heat conductive material, said wall having one side in substantial abutment with said flat surface of said body to be in heat conductive relation therewith and in electrical contact with said one of said elements;

a fluid flow heat exchanger on the other side of said wall in heat exchange relation therewith; and

means including said wall and encapsulating said body,

there being two said walls in spaced relation, each forming a fluid boundry of said heat exchanger, and there being two said bodies, each in substantial abutment with a respective wall, and a pair of electrically conductive means sandwiching each said body against the respective wall and forming part of said encapsulating means; said heat exchanger being comprised of a series of plates sandwiched by said walls, said series including a central distribution plate and alternating apertured and baffle plates on each side thereof.

4,559,581

ELECTROLYTIC CAPACITOR

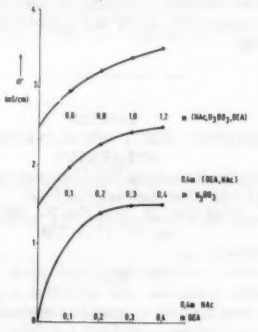
Antonius J. H. Eijkelenkamp, Eindhoven; Jan H. Held, and Gerardus J. A. Rientjes, both of Zwolle, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,074

Claims priority, application Netherlands, Jul. 18, 1983, 8302559

Int. Cl.⁴ H01G *9/00*

U.S. Cl. 361—433 **9 Claims**



1. An electrolytic capacitor comprising an anode provided

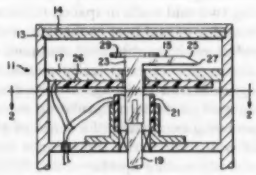
with a dielectric oxide layer by anodic oxidation, a cathode, a spacer and an electrolyte solution consisting of a solution of a salt of an amine with an organic carboxylic acid and boric acid in a solvent consisting of one or more dipolar aprotic compounds, characterized in that the solvent of the electrolyte consists essentially of one or more monoalkylated or dialkylated amides of carboxylic acids having 1, 2 of 3 carbon atoms in which are dissolved an amine in a quantity of at least 0,20 mol/kg of solvent, acetic acid and/or propionic acid in a quantity of at least 0,20 mol/kg of solvent, and boric acid in a quantity of at least 0,01 mol per kg of solvent, the amine being present in a quantity between substantially 0,25 to 1,5× the number of equivalents of the acetic acid and/or the propionic acid, and the boric acid being present in a quantity which is at most approximately equal to 5× the number of equivalents of the acetic acid and/or the propionic acid, all this in such manner that a conductivity of at least 1 mS/cm at 25° C. is reached.

4,559,582

INDICATOR ILLUMINATED WITH ELECTROLUMINESCENT LIGHTING

A. Vincent Scardilli, West Orange, and Alfred L. Levine, Kinnelon, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 4, 1984, Ser. No. 646,407
Int. Cl.⁴ G01D *11/28*
U.S. Cl. 362—23 **13 Claims**



1. Electroluminescent lighting means for illuminating an indicator which moves relatively to a graduated scale, characterized by:

an electroluminescent light source;

a shaft which includes an optical receiving element;

an optical transmitting media optically connected to the optical receiving element and to the indicator, the shaft being fixed to the optical receiving element and to the indicator;

the electroluminescent light source substantially surrounding the optical receiving element in at least one plane; and

the indicator having a capability of receiving light from the light transmitting media and transmitting said light for viewing.

4,559,583

GREETING CARD WITH BLINKING LIGHT APPARATUS

Ming-ho Ku, Kowloon, Hong Kong, assignor to Tradebest International Corporation, Los Angeles, Calif.

Filed Mar. 28, 1984, Ser. No. 594,209
Int. Cl.⁴ F21V *7/04*
U.S. Cl. 362—32 **1 Claim**

1. A greeting card having a perforation and enclosing a blinking light apparatus, said apparatus comprising a light emitter, a length of fiber optic in communication with the emitter, and a blinking control unit regulating the transmission of light from the emitter and the fiber optic, said fiber optic having an incision in alignment with the perforation, said incision further transmitting light from within the fiber optic through the perforation providing a viewer with the view of a

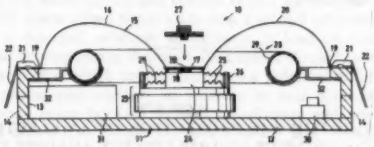
blinking light at the perforation by a concentrated high magnitude optical effect at the incision.

4,559,584

COMBINATION LIGHTING DEVICE AND LOUDSPEAKER

Toshikatsu Kuwahata; Fumio Kawabata, both of Tokyo, and Genzo Kurosawa, Yamato, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 3, 1984, Ser. No. 608,020
Int. Cl.⁴ H04M *1/22*
U.S. Cl. 362—86 **11 Claims**



1. A lighting device and loudspeaker assembly comprising:

(a) a frame;

(b) a loudspeaker unit having a diaphragm mounted on said frame for producing sound, said diaphragm being made of a light-transmissive material; and

(c) a light source disposed in a space defined between said frame and said diaphragm for emitting light through said diaphragm, said diaphragm extending to cover said light source so that light emitted from said source is diffused by passing through said diaphragm into a room and the like in which said assembly is located.

4,559,585

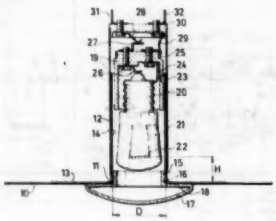
ILLUMINATING ARRANGEMENT IN MICROWAVE OVENS

Per H. I. Almgren, and Christian H. P. Durne, both of Norrköping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,791
Claims priority, application Sweden, Mar. 23, 1983, 8301593
Int. Cl.⁴ F21V *33/00*; H05B *6/68*
U.S. Cl. 362—92 **3 Claims**

1. An arrangement for illuminating an interior of cavity of a microwave oven comprising a lamp mounted in a lamp holder which is disposed outside the oven cavity behind a window in a cavity wall so that light emitted by the lamp is transmitted to the interior of the cavity through the window, characterized in that the lamp holder is coaxially arranged within an electrically conductive sleeve mounted on an outside surface of the cavity wall so that the lamp can be axially arranged within the sleeve, one end of the sleeve being electrically connected at microwave frequencies to cavity wall parts surrounding an aperture in the cavity wall bounding the window, which can

be covered by a transparent body, in that a resulting waveguide constituted by the sleeve and having the aperture as input has a cut-off wavelength smaller than that of operating frequency of the microwave oven, in that the mounted lamp has its filament within the sleeve at a sufficient distance from



the aperture for leaking microwave energy reaching the filament to have been substantially attenuated, and in that the arrangement is adapted to enable access to the lamp, from the interior of the cavity, the lamp being removable through the sleeve and aperture.

4,559,586

SAFETY HELMET

Michael Slarve, 11222 Balcom Ave., Granada Hills, Calif. 91344

Filed Dec. 26, 1984, Ser. No. 686,433
Int. Cl.⁴ F21V *33/00*; F21L *15/14*
U.S. Cl. 362—106 **7 Claims**

1. In combination with a motor driven bike or the like having brakes, an electrical power supply and a tail lamp, and having means including an electrical switch to increase the illumination provided in or around the tail lamp responsive to the application of the brakes, a rider's helmet comprising:

a head conforming shell;

an auxiliary brake lamp fixed relative to the rearward external surface of said shell;

at least first and second wires connected from said switch to supply power when said brakes are applied;

third and fourth wires connected to supply power to said auxiliary brake lamp; and

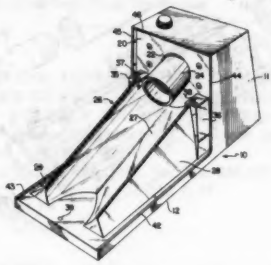
a quick detachable electrical connector matable for connecting said first and second wires to said third and fourth wires, respectively.

4,559,587

WALL MOUNTED LUMINAIRE

Honesto D. Quiogue, Blacksburg, Va., and Ian Lewin, Scottsdale, Ariz., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Nov. 17, 1983, Ser. No. 552,620
Int. Cl.⁴ F21S *3/02*
U.S. Cl. 362—147 **10 Claims**



1. A luminaire for illuminating an area adjacent a generally vertical surface comprising

a housing having a generally vertically rectangular back portion with a surface adapted to be mounted adjacent said vertical surface, said housing having

an enclosed upper portion extending away from said back portion for supporting a generally downwardly extending lamp socket and for containing electrical components associated with energization of an axially elongated lamp having a predetermined circumference;

a lower portion supporting a reflector;

a lamp socket supported in said upper portion and extending in front of said lower portion with the central axis of said socket inclined at an acute angle with respect to a plane formed by said back portion toward a lower end of said back portion so as to support said lamp with its axis similarly inclined;

said reflector having an elongated central portion which is U-shaped in cross section as viewed along said central axis and extends at an acute angle paralleling said lamp and socket, said reflector encircling at least a fifth of the circumference of said lamp and forming axially extending distal edges;

said reflector having side portions extending rearwardly and outwardly from the distal edges of the central portion;

a transparent refractor having a front wall, side walls and a bottom wall shaped to enclose said lower portion including said lamp, socket and reflector; and

means for releasably attaching said refractor to said back portion.

4,559,588

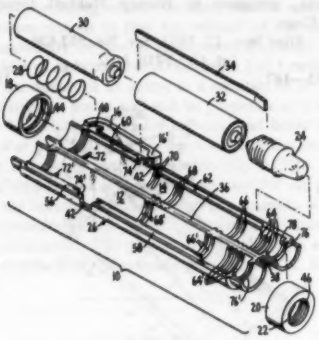
PENLITE AND METHOD OF ASSEMBLING THE SAME

Steven N. Engelson, P.O. Box 2651, Walnut Creek, Calif. 94553, and John McAnallan, 228 Sausalito St., Corte Madera, Calif. 94925

Filed Jan. 3, 1984, Ser. No. 567,902
Int. Cl.⁴ B62J *5/00*
U.S. Cl. 362—196 **7 Claims**

1. A penlite the body of which is comprised of two semicylindrical members of molded plastic material joined along a common edge by a web hinge which is integral therewith, said body being provided on its inner surface with a plurality of ribs

adapted to maintain two cylindrical batteries and an incandescent lamp in operative alignment when said semi-cylindrical



members are locked together in face-to-face relation to form a cylindrical body member.

4,559,589

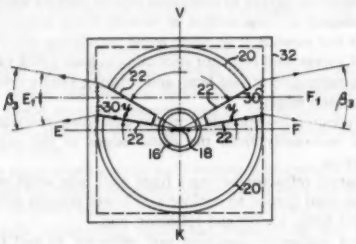
LIGHTING FIXTURE WITH A CONCAVE REFLECTOR, SUCH AS A TAIL, WARNING OR SIGNAL LIGHT ETC.

Knut O. Sassemannshausen, 5 Pinewood Estate, Wexford, Ireland

Continuation of Ser. No. 121,022, Feb. 13, 1980, abandoned. This application Sep. 16, 1983, Ser. No. 533,611

Int. Cl.⁴ F21V *7/00*

U.S. Cl. 362—305 **11 Claims**



1. Lighting fixture comprising an enclosure, means disposed in said enclosure, for supplying a central source of light therein, a concave, generally parabolic reflector for directing a main beam of light out of said enclosure from said source generally along a given optical axis, said central source of light being located at the focal region of said concave reflector, said concave reflector having a light penetrable region thereof disposed at least at one side of said optical axis in a horizontal plane in common with said central light source, said light penetrable region forming an escape window out of said enclosure for part of the light from said source, said means for supplying said central source of light comprising a luminous body, and including a collecting lens disposed in front of said luminous body and an optical system in front of said collecting lens for scatterling light in only two opposing directions in said horizontal plane.

4,559,590

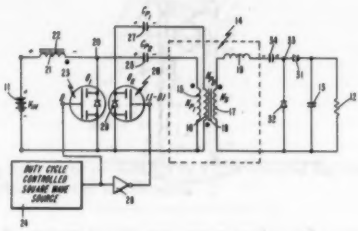
REGULATED DC TO DC CONVERTER

Christopher D. Davidson, Guelph, Canada, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 24, 1983, Ser. No. 478,429

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **35 Claims**



1. A converter responsive to a DC source for driving a DC load comprising a transformer having winding means including primary and secondary winding means, inductor means series connected between the source and the primary winding means, first switch means for shunting current flowing from the source through the inductor means when closed, resonant circuit means coupled to the winding means, second switch means connected to the primary winding means, rectifier means connected between the secondary winding means and the load, means for activating the first and second switches to be opened and closed at mutually exclusive times at a predetermined frequency, the first switch means being connected to the inductor means and primary winding means so that a first current component from the supply flows through it via the inductor means and a second current component having a sinusoidal component flows through it in response to discharge of energy stored in the resonant circuit means, the second component beginning approximately simultaneously with closure of the first switch means, the second switch means when closed being connected so that a third bi-directional current component flows through it in response to energy stored in the inductor means, the rectifier means being connected between the secondary winding means and the load so the secondary winding means supplies substantial current to the load, and means responsive to the DC source for supplying energy to the primary winding means.

4,559,591

D.C. VOLTAGE CONVERTER INCLUDING A PULSE WIDTH CONTROLLED SEMICONDUCTOR SWITCH

Eckhardt Grünsch, Allmersbach im Tal, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 536,956

Claims priority, application European Pat. Off., Sep. 30, 1982, 82109058.6

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **4 Claims**

1. A d.c. voltage blocking converter having energy storage phases alternating with energy discharge phases, said converter comprising:

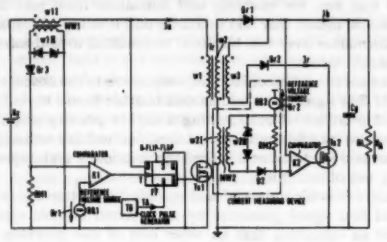
a power transformer having a core and at least primary, secondary and tertiary windings associated with said core;

a primary circuit including said primary winding and a pulse width controlled semiconductor switch connected in series with said primary winding for conducting an energy storage current during the energy storage phase of said converter;

a secondary circuit including said secondary winding, a smoothing capacitor and at least one rectifier element connecting said smoothing capacitor to said secondary

winding for conducting an energy discharge current during the energy discharge phase of said converter; and

circuit means comprising a second semiconductor switch controlled by a reference signal for connecting said tertiary winding to said smoothing capacitor so that, following the energy discharge phase of said converter, excess energy of said smoothing capacitor in the form of an energy feedback current is fed back into said core until the start of the next energy storage phase of said converter.

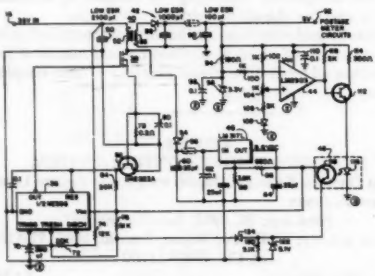


4,559,592

ELECTRONIC POSTAGE METER HAVING A SWITCHING POWER SUPPLY EMPLOYING INTEGRATED CIRCUIT TIMER

Arno Muller, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 31, 1984, Ser. No. 615,660
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—21 **13 Claims**



1. In an electronic postage meter having means for printing postage and accounting means for accounting for postage printed by said printing means, secure housing means for protecting said printing means and said accounting means, a source of operating potential external to said secure housing means, a system for energizing said accounting means mounted within said secure housing means, comprising:

a transformer having a primary winding and a secondary winding, said primary winding coupled to said source of operating potential;

a three terminal switching device having a first and second electrode and a control electrode, said first and second electrode current path coupled to said primary winding of said transformer to control the current flow through said primary winding;

a timer circuit having a first terminal means and second terminal means, said timer first terminal means adapted to oscillate at a frequency depending on the voltage applied to said timer circuit second terminal means, said timer circuit first terminal means coupled to said three terminal control device control electrode; and

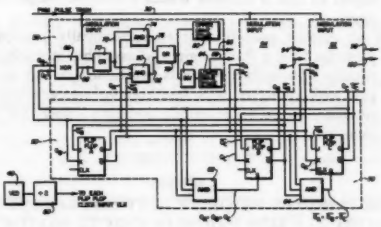
a feedback circuit means coupled between said transformer primary and secondary windings and said timer circuit second terminal means for varying the voltage applied to said timer circuit second terminal means to turn the timer circuit on or off depending upon the voltage level developed in said transformer secondary winding, said feedback circuit means including a regulator circuit means coupled between said primary winding of said transformer and said timer circuit second terminal means for providing a regulated voltage level feedback.

4,559,593

METHOD AND APPARATUS FOR REDUCING THE NUMBER OF SWITCHING TRANSITIONS IN A VOLTAGE SOURCE INVERTER

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 19, 1983, Ser. No. 534,170
Int. Cl.⁴ H02M *1/14*
U.S. Cl. 363—41 **22 Claims**



1. An improved method of operating a voltage source inverter which generates n-phase AC voltages from a DC source which develops two voltage levels on two rails, the inverter having n pairs of switches coupled across the two rails which are operated in on and off states to connect a junction between the switches of a pair to one of the rails to develop a phase output at the junction, the inverter being controlled by n-phase logic circuitry which receives a clock signal and a pulse width modulated, or PWM, wave switching between a high and a low state, the improvement comprising:

generating n phase timing waveforms from the clock signal, each phase timing waveform representing the condition of a pair of switches in the inverter when the PWM wave is in the high state;

identifying n_1 and n_2 phase outputs from the n phase timing waveforms, n_1 of the phase outputs being connected to one rail while n_2 phase outputs are connected to the other rail, where $n_1 \leqq n_2$ and $n_1+n_2=n$; and

operating the switches associated with the n_1 phases such that the phase outputs are all connected to the same rail when the PWM wave is in the low state whereby a defined applied voltage output is produced with a minimum number of switch transitions between the on and off states.

4,559,594

ELECTROSTATIC AIR CLEANER AND HIGH VOLTAGE POWER SOURCE THEREFOR

Lawrence M. Sears, Shaker Heights, and Terrance C. Slaby, North Royalton, both of Ohio, assignors to Adams Manufacturing Company, Cleveland, Ohio

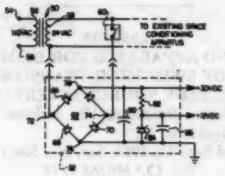
Filed Nov. 25, 1983, Ser. No. 554,928
Int. Cl.⁴ H02M *7/06*; B03C *3/02*
U.S. Cl. 363—126 **21 Claims**

1. Electrostatic air cleaner apparatus for use in conjunction with space conditioning apparatus which includes a transformer for providing a low voltage AC power signal to control

elements included with said space conditioning apparatus, comprising:

power supply means adapted to be coupled to said transformer for converting said low voltage AC power signal to a low voltage DC power signal;

high voltage generator and regulator means powered by said low voltage DC power signal for generating a high voltage DC signal suitable for energizing an electrostatic air



cleaner assembly and for regulating the high voltage DC signal so that it remains within a selected range of voltages;

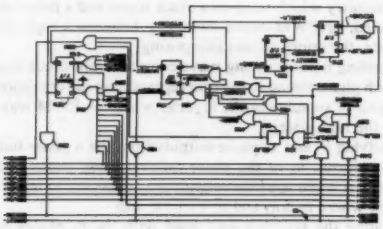
an air cleaner assembly for electrostatically precipitating particles from a flow of air, said assembly including electrically conductive elements positioned in the air flow path and connected with said high voltage generator and regulator means for receiving said high voltage DC signal therefrom.

4,559,595

DISTRIBUTED PRIORITY NETWORK LOGIC FOR ALLOWING A LOW PRIORITY UNIT TO RESIDE IN A HIGH PRIORITY POSITION

Daniel A. Boudreau; Edward R. Salas, both of Billerica, and James M. Sandini, Berlin, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 27, 1982, Ser. No. 453,406
Int. Cl.[4] G06F *9/46, 15/16*
U.S. Cl. 364—200 **17 Claims**



1. In a data processing system having a plurality of units coupled to transfer information over a bus, each of said units capable of transferring information, a distributed priority network wherein priority is normally determined by physical position on said bus, said network including priority logic in each of said units and wherein said priority logic of at least one of said plurality of units is a modified priority logic, said modified priority logic comprising:

(A) first bistable means of a modified unit of said plurality of units for asynchronously indicating that said modified unit is ready to transfer information over said bus to a receiving unit of said plurality of units;

(B) second bistable means of said modified unit, responsive to said first bistable means indicating that said modified unit is ready to transfer information over said bus, for generating a first signal on said bus indicating to each of said plurality of units that at least one of said plurality of units is requesting use of said bus to transfer information over said bus to another unit of said plurality of units;

(C) means of said modified unit, responsive to the absence of said first signal on said bus the absence of which indicates that no other unit of said plurality of units is requesting use of said bus, for enabling said indication from said first bistable means that said modified unit is ready to transfer information over said bus to be transmitted to said second bistable means;

(D) means of said modified unit, responsive to the absence of said first signal from said second bistable means in each of said plurality of units having a higher priority physical position on said bus than said modified unit for indicating that said modified unit is the highest priority unit requesting use of said bus;

(E) third bistable means of said modified unit, responsive to said first signal generated by said second bistable means and an indication that no other unit of said plurality of units having a higher priority is requesting use of said bus, for generating a second signal on said bus;

(F) means in each of said plurality of units, responsive to the receipt of said second signal from said bus, for generating a strobe signal within each of said plurality of units for enabling the receipt of information transferred from said modified unit;

(G) first means of said modified unit, responsive to an acknowledgement that said information has been received by said receiving unit, for disabling said third bistable means of said modified unit;

(H) second means of said modified unit, responsive to the disabling of said third bistable means, for unconditionally disabling said second bistable means of said modified unit; and

(I) third means of said modified unit, responsive to the disabling of said third bistable means, for disabling said first bistable means if said modified unit did not receive an acknowledgement indicating the transfer of information over said bus should be retried,

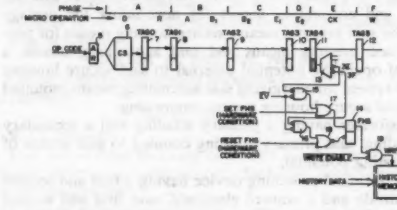
and whereby said modified unit having said modified priority logic, regardless of physical position on said bus, is of lower priority than all other units of said plurality of units coupled to said bus.

4,559,596

HISTORY MEMORY CONTROL SYSTEM

Katsumi Ohnishi, Kawagoe, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1983, Ser. No. 509,647
Claims priority, application Japan, Jun. 30, 1982, 57-113464
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **3 Claims**



1. A history memory control system in a data processing system, comprising:

a history memory for serially collecting and storing internal state information;

a freeze control circuit connected to said history memory, for inhibiting update of said history memory and releasing said history memory;

condition sensing means, connected to said freeze control circuit, for sending first freeze and release signals in accor-

dance with predetermined hardware conditions to said freeze control circuit;

a microprogram processing system for executing micro-instructions which include a control field for history memory freeze and release micro-instructions;

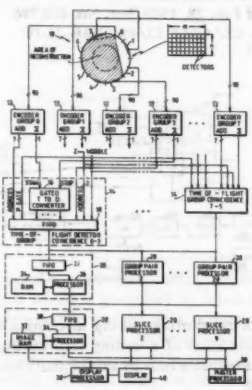
decoding means, connected to said freeze control circuit and said microprogram processing system, for decoding the control field in the micro-instructions and sending second freeze and release signals to said freeze control circuit when the history memory freeze and release micro-instructions are decoded, thereby said history memory is controlled both when the predetermined hardware conditions are generated and when history memory freeze and release micro-instructions are executed.

4,559,597

THREE-DIMENSIONAL TIME-OF-FLIGHT POSITRON EMISSION CAMERA SYSTEM

Nizar A. Mullani, Houston, Tex., assignor to Clayton Foundation for Research, Houston, Tex.

Filed Jul. 7, 1982, Ser. No. 396,098
Int. Cl.[4] G06F *15/42*; G01T *1/20*
U.S. Cl. 364—414 **40 Claims**



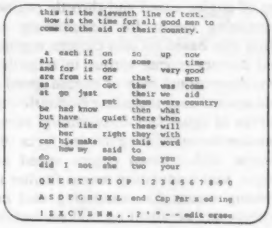
32. A time-of-flight positron emission camera having a plurality of detector rings positioned side-by-side around an area of reconstruction, each detector ring defining a plane slice through the area of reconstruction and each pair of adjacent rings having at least two inter-plane slices defined therebetween through the area of reconstruction, each ring having a plurality of sincintillation detectors with each detector having an opposed detector on its ring together defining a detector pair having a coincidence line therebetween for detecting the two photons emitted from a positron-electron annihilation occurring the plane slice of the detectors, and where detector pairs formed from detectors on different rings have cross-coincidence lines therebetween also for detecting annihilations in the area of reconstruction, the camera including a means for increasing the radiation detection efficiency of the camera by determining from time-of-flight information the location of each detected annihilation in the area of reconstruction obtained along cross-coincidence lines and including these detected annihilations in the image data of the plane or interplane slice closest to the location of the detected annihilation.

4,559,598

METHOD OF CREATING TEXT USING A COMPUTER

Eric Goldwasser, and Dorothy Goldwasser, both of 993 Barberry Rd., Yorktown Heights, N.Y. 10598

Filed Feb. 22, 1983, Ser. No. 468,493
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—419 **11 Claims**


this is the eleventh line of text.
How is the time for all good men to
come to the aid of their country.
a each if on so up now
all in of some time
and for is one very good
are from it or that men
as cut the was come
at go just their we aid
put them were country
be had know then what
but have quiet there when
by he like these will
her right they with
can his make this word
how my said to
do see too you
did I not she two your
Q W E R T Y U I O P 1 2 3 4 5 6 7 8 9 0
A S D F G H J K L end Cap Par s od ing
! Z X C V B N M , . ? ' " - - edit erase

1. A method of creating text using a computer having a memory, at least one display screen and means for selecting positions on said screen, said method comprising the steps of:

(a) storing in said memory a dictionary of frequently used linguistic expressions, at least some of said linguistic expressions having a plurality of alphanumeric characters;

(b) displaying on a first section of said screen a plurality of said linguistic expressions arranged in a predetermined order for selection by a user;

(c) displaying on a second section of said screen at least one line of text, as said text is created by a user;

(d) identifying the position of a linguistic expression on said first section of said screen, in response to selection of that position by a user with said position selecting means; and

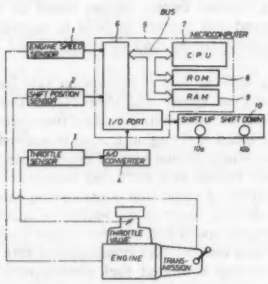
(e) displaying the linguistic expression, whose position was identified in step (d), in said second section of said screen, concatenated to the end of said line of text, thereby adding a linguistic expression to said line of text.

4,559,599

OPTIMUM SHIFT POSITION INDICATION USING SUCCESSIVE TWO-DIMENSIONAL DATA MAPS

Nobuo Habu; Kouichi Osawa; Yuuichi Kato; Michio Furuhashi; Taiyo Kawai; Junichi Saiki; Toshio Ito, all of Susono, and Tsutomu Nakamura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 11, 1983, Ser. No. 474,324
Claims priority, application Japan, Mar. 18, 1982, 57-43655
Int. Cl.[4] B60K *41/18*; G09B *19/16*; G07C *5/08*
U.S. Cl. 364—424.1 **12 Claims**



1. An electronically controlled system in an internal combustion engine for indicating shift position for a manual transmis-

sion thereof so as to maintain optimum fuel consumption by the engine, comprising:

first detecting means for detecting current engine speed;

second detecting means for detecting current throttle position;

third detecting means for detecting current shift position;

first determining means for determining current engine torque based on said current engine speed and current throttle position in accordance with a first two-dimensional map of engine speed and throttle position;

second determining means for determining current fuel consumption rate based on said current engine speed and determined current engine torque in accordance with a second two-dimensional map of engine speed and engine torque, said second map including isometric curves representing curves of equal fuel consumption rates;

calculating means for calculating driving force of the engine in accordance with current engine speed and current engine torque, said calculating means further including:

first comparing means for comparing said current fuel consumption rate obtained by said second determining means with an assumed one-step-transmission upshifted fuel consumption rate determined by one-step-transmission upshifted engine speed and one-step-transmission upshifted engine torque defined by said second map,

second comparing means for comparing said current fuel consumption rate obtained by said second determining means with an assumed one-step-transmission downshifted fuel consumption rate determined by one-step-transmission downshifted engine speed and one-step-transmission downshifted engine torque defined by said second map,

outputting means for outputting a first signal indicative of one-step upshifting, a second signal indicative of one-shift downshifting, or a third signal indicative of stopping both one-step upshifting and downshifting, respectively, whenever said first comparing means determines said assumed fuel consumption rate of one-step upshifting is less than the currently detected fuel consumption rate, said second comparing means determines said assumed fuel consumption rate of one-step downshifting is less than the currently detected fuel consumption rate, or both values of fuel consumption rate calculated in said first and second comparing means are detemined greater than the currently detected fuel consumption rate; and

representing means for alternatively representing whichever of said three signals are output by said outputting means.

7. A method for indicating shift position for a manual transmission associated with an internal combustion engine so as to maintain optimum fuel consumption by the engine, comprising the steps of:

detecting the current engine speed;

detecting the current throttle position;

detecting the current shift position;

determining current engine torque based on said current engine speed and current throttle in accordance with a first two-dimensional map of engine speed and throttle position;

determining current fuel consumption rate based on said current engine speed and determined current engine torque in accordance with a second two-dimensional map of engine speed and engine torque in accordance with a second two-dimensional map of engine speed and engine torque, said second map including isometric curves representing curves of equal fuel consumption rates;

calculating driving force of the engine in accordance with current engine speed and current engine torque;

comparing said current fuel consumption rate with an assumed one-step upshifted fuel consumption rate determined by one-step upshifted engine speed and one-step upshifted engine torque defined by said second map;

comparing said current fuel consumption rate with an assumed one-step downshifted fuel consumption rate determined by one-step downshifted engine speed and one-step downshifted engine torque defined by said second map;

outputting a first signal indicative of one-step upshifting, a second signal indicative of one-step downshifting, or a third signal indicative of stopping both one-step upshifting and downshifting, respectively, if the assumed fuel consumption rate of one-step upshifting is less than the current detected fuel consumption rate, the assumed fuel consumption rate of one-step downshifting is less than the current detected fuel consumption rate, or both values of fuel consumption rate are determined greater than the current detected fuel consumption rate;

representing to an operator of said engine the respective three signals for executing upshifting, downshifting and keeping the shift position unchanged.

4,559,600

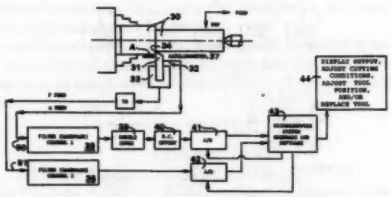
MONITORING MACHINE TOOL CONDITIONS BY MEASURING A FORCE COMPONENT AND A VIBRATION COMPONENT AT A FUNDAMENTAL NATURAL FREQUENCY

Surendra B. Rao, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Feb. 28, 1983, Ser. No. 470,796

Int. Cl.⁴ G06F *15/46*; G08B *23/00*

U.S. Cl. 364—474 **23 Claims**



1. A method for monitoring, during machining of a workpiece, the wear condition of a cutting tool having a cutting portion in a structure that is held by substantially more massive means, comprising

measuring the component of the dynamic force exerted between the tool and the workpiece approximately in the direction normal to the primary cutting edge of the tool and to the main cutting velocity at approximately the fundamental natural frequency of the held structure in the same normal direction,

measuring the component of vibration in the tool approximately in the same normal direction at approximtely the same frequency,

computing the value of a predetermined wear indicative function of the ratio of the measured force component to the measured vibration component, and

providing a predetermined type of response to the computed value of the function comprising at least one of the following operations,

(a) adjusting cutting conditions to control the rate of wear,

(b) adjusting the position of the tool relative to the workpiece to compensate for recession in the cutting portion of the tool,

(c) replacing the tool when the wear on a cutting portion exceeds a selected limit.

4,559,601

NUMERICALLY CONTROLLED CUTTING METHOD

Hajimu Kishi, Hino; Masaki Seki, Tokyo, and Kunio Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

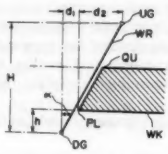
PCT No. PCT/JP82/00104, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO82/03474, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 5, 1982, Ser. No. 451,145

Claims priority, application Japan, Apr. 4, 1981, 56-050967

Int. Cl.[4] G05B *19/403*

U.S. Cl. 364—475 7 Claims



1. A numerically controlled cutting method of cutting a curved surface which is generated by interconnecting corresponding points on two curved lines, comprising the steps of:

supplying as inputs curve information specifying the two curved lines, information on the shape of a cutter such as cutter radius, information on the direction of cutter radius compensation, and division information for dividing the curved lines;

dividing the curved lines based on said division information to determine dividing points mi, ni (i=1, 2, . . .);

determining the vectors of normals in said direction of cutter radius compensation at the dividing point mi on one of the curved lines and at the corresponding dividing point ni on the other curved line, and computing cutter compensation positions mi', ni' corresponding to the dividing points mi, ni upon cutter position compensation along the directions of the normals using said information on the shape of the cutter;

computing a cutter axis direction (I, J, K) from said cutter compensation positions mi', ni';

computing movement data on control axes of a numerically controlled machine tool using coordinates (X, Y, Z) of the cutter compensation position ni' and said cutter axis direction (I, J, K); and

moving the cutter relative to a workpiece based on said movement data on the control axes to cut the curved surface.

4,559,602

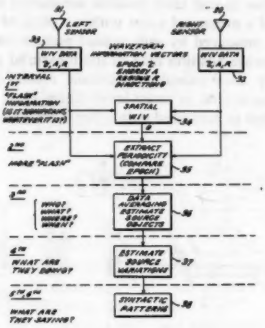
SIGNAL PROCESSING AND SYNTHESIZING METHOD AND APPARATUS

John K. Bates, Jr., 240 Ridgefield Rd., Endicott, N.Y. 13760

Filed Jan. 27, 1983, Ser. No. 461,548

Int. Cl.[4] G06F *15/31*; G01R *23/02*

U.S. Cl. 364—487 42 Claims



1. The process of analyzing a complex waveform

$$f(t) = \sum_{k=1}^{m} A\, e^{tk(t-\tau k)}$$

wherein

$A_k = k^{th}$ amplitude coefficient

$s_k = k^{th}$ complex frequency $(\alpha_k + j\beta_k)$

τ_k = epoch (start) of k^{th} excitation function;

said process comprising the steps of determining at least two waveform information vectors (WIVs), said waveform information vectors each comprising at least two components from the vector space having as components epoch, residue R and direction θ of arrival of said waveform, wherein said waveform information vectors are measured at the instant at least one of f(t) or d/dt is at a predetermined condition, and determining the existence of a given immediate flash information characteristic in said waveform by comparison of said at least two WIVs to predetermined values, said residue being an amplitude independent function of the waveform as determined upon the occurrence of a predetermined feature of the signal waveform.

4,559,603

APPARATUS FOR INSPECTING A CIRCUIT PATTERN DRAWN ON A PHOTOMASK USED IN MANUFACTURING LARGE SCALE INTEGRATED CIRCUITS

Ryoichi Yoshikawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1983, Ser. No. 535,334

Claims priority, application Japan, Oct. 5, 1982, 57-173980

Int. Cl.[4] G01N *21/32*

U.S. Cl. 364—491 11 Claims

1. An apparatus for inspecting a circuit pattern of a photomask for manufacturing large scale integrated circuits comprising:

a measuring table on which the photomask is placed, said measuring table being movable along x and y directions;

table driving means for continuously moving said measuring table in one direction;

table position measuring means for measuring a position of said measuring table;

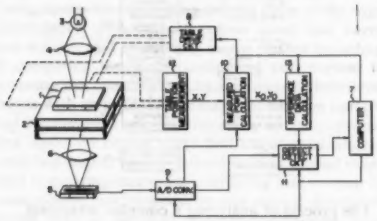
optical pattern measuring means for scanning the photomask in a direction substantially perpendicular to the moving

direction of said measuring table to sequentially produce analog measured signals at measured points along the scanning direction of the photomask in response to light transmitted through the photomask;

analog-to-digital converting means coupled to said optical pattern measuring means for converting the analog signal to multi-level digital measured data;

measured point calculation circuit means for calculating, in response to said table position measuring means, the position of a measured point within a pixel of the photomask being measured by said optical pattern measuring means to provide position data of the measured point;

reference data calculation circuit means for calculating reference data, as multi-level digital data, which is to be obtained as measured data when a design circuit pattern is



measured by said optical pattern measuring means at each of the measured points on the basis of the design pattern data represented by binary data for each of a plurality of pixels within a two-dimensional pixel array centered at the pixel including the measured point on the photomask being measured by said optical pattern measuring means, the position data of the measured point on the photomask calculated by said measured point calculation circuit means, and sensitivity distribution characteristic data of an image sensor element of said optical pattern measuring means; and

defect detecting means for comparing the measured data from said analog-to-digital converting means with the reference data calculated by said reference data calculation circuit means to detect the presence or absence of a pattern defect at the measured point.

4,559,604

PATTERN RECOGNITION METHOD

Akira Ichikawa, Musashino, and Hiroko Matsuzaka, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,154

Claims priority, application Japan, Sep. 19, 1980, 55-129327; May 22, 1981, 56-76564

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 364—513.5 **14 Claims**

GROUP	CONSONANT	CONSONANT(S) OF SAME MANNER OF PRODUCTION	CONSONANT(S) OF SAME PLACE OF ARTICULATION	NUMBER (N)
1	/b/	/f, p/	NONE	3
2	/d/	NONE	/z, t, s/	4
3	/z/	NONE	/d, t, s/	4
4	/t/	/s, p/	/d, z, s/	6
5	/p/	/s, t/	NONE	3
6	/s/	NONE	/d, z, t/	4

1. A machine implemented pattern recognition method comprising comparing input patterns with standard patterns, selecting a plurality of candidates that are likely to be input patterns according to identified values that represent the results of the comparison, and inferring an input pattern among the selected candidates that are likely to be input patterns according to a predetermined criterion of inference which is determined from the commonness of the nature of each of the selected candidates with the other selected candidates.

4,559,605

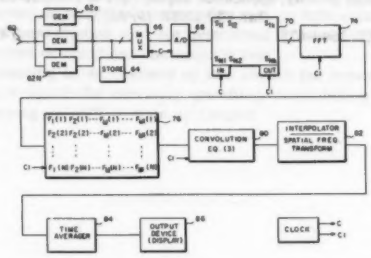
METHOD AND APPARATUS FOR RANDOM ARRAY BEAMFORMING

Keith Norsworthy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 16, 1983, Ser. No. 532,854

Int. Cl.⁴ G06F *15/31, 15/332;* G01S *3/80*

U.S. Cl. 364—726 **26 Claims**



1. Beamforming apparatus comprising:

(a) a plurality of transducers randomly distributed for receiving radiant energy, said transducers generating analog output signals indicative of the received radiant energy,

(b) means for converting said analog transducer output signals at a predetermined sampling rate into digital signals,

(c) means for storing a group of said digital signals for each transducer,

(d) means for performing a discrete Fourier transformation of each group of digital signals to obtain Fourier frequency coefficients $F_\omega(k)$ where ω identifies the frequency and k is an integer having values 1,2 . . . N identifying the transducer, N being the total number of distributed transducers,

(e) means for spatially convolving said coefficients $F_\omega(k)$ of equal ω to obtain a set of coefficients $G_\omega''(D)$ where D is the spacing between pairs of transducers,

(f) means for generating additional values of $G_\omega''(D)$ by interpolation to obtain a substantially continuous function $I_{107}''(D)$,

(g) means for performing a spatial Fourier transformation of $I_{107}''(D)$ to obtain a transform function $T_f(F)$ where F is a parameter representing the different spatial frequencies in $I_{107}''(D)$

(h) means for averaging a plurality of values of at least one of $G_\omega''(D)$, $I_\omega''(D)$ and $T_\omega(F)$ from a plurality of said output signal groups, and

(i) means, responsive to the averaged or average-derived value of $T_\omega(F)$ for generating an output representative of the far field power of said radiant energy as a function of angle.

4,559,606

ARRANGEMENT TO PROVIDE AN ACCURATE TIME-OF-ARRIVAL INDICATION FOR A RECEIVED SIGNAL

Maurice L. Jezo, Cedar Grove, and Ning H. Lu, Parsippany, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,280

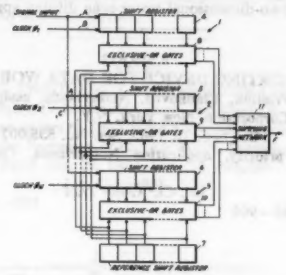
Int. Cl.⁴ G06F *15/336*

U.S. Cl. 364—728 **6 Claims**

1. An arrangement to provide an accurate time-of-arrival indication for a received signal comprising:

N correlation means coupled to said received signal, where N is an integer greater than one, said received signal being clocked into each of said N correlation means by a different one of N-phase clocks, said N-phase clocks occurring

at a predetermined different time uniformly spaced over a given time interval; and



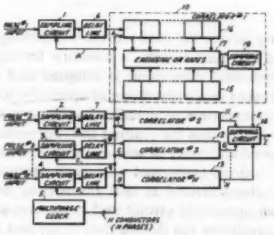
integration means coupled to each of said N correlation means to provide said indication of said time-of-arrival of said received signal.

4,559,607

ARRANGEMENT TO PROVIDE AN ACCURATE TIME-OF-ARRIVAL INDICATION FOR A PLURALITY OF RECEIVED SIGNALS

Ning H. Lu, Parsippany, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,810
Int. Cl.⁴ G06F *15/336*
U.S. Cl. 364—728 **22 Claims**



1. An arrangement to provide an accurate time-of-arrival indication for N received signals, where N is an integer greater than one, comprising:

N signal channels, each responsive to a different one of said N signals, each of said N channels including:

first means to provide predetermined samples of the associated one of said N signals, and

second means coupled to said first means to correlate said predetermined samples with a reference signal; and

third means coupled to each of said second means to integrate the correlated output signals of each of said second means to provide said indication of said time-of-arrival of said N signals.

4,559,608

ARITHMETIC LOGIC UNIT

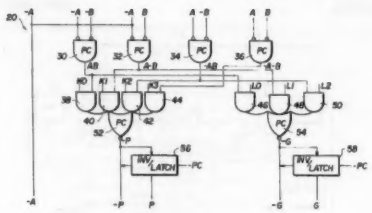
William R. Young, Palm Bay, Fla., and Leon F. Parisoe, Raleigh, N.C., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 21, 1983, Ser. No. 460,061
Int. Cl.⁴ G05F *7/50*
U.S. Cl. 364—786 **29 Claims**

1. In an arithmetic logic unit having a first section for producing a propagate and a generate output signals from a pair of input variables per bit and logic select signals provided thereto, and a second section for producing a carry and a sum output signal from said propagate and generate signals, the improvement comprising:

first precharge means in said first section for precharging the propagate and generate output signal to a first logic level in response to precharge signals;

first latch means integral with said arithmetic logic unit and responsive to a transition of said propagate output signal



from said first logic level to a second logic level for maintaining said propagate signal at said second logic level until the next precharge signal; and

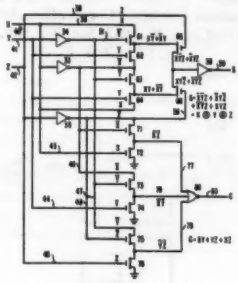
second latch means integral with said arithmetic logic unit and responsive to a transition of said generate output signal from said first logic level to a second logic level for maintaining said generate output signal at said second logic level until the next precharge signal.

4,559,609

FULL ADDER USING TRANSMISSION GATES

William V. Robinson, Jr., Florham Park, and Richard R. Shively, Convent Station, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1983, Ser. No. 464,641
Int. Cl.⁴ G06F *7/50*
U.S. Cl. 364—784 **12 Claims**



1. An adder for binary digits comprising

first and second sources of binary digits to be added,

first and second inverters for complementing digits from said first and second sources,

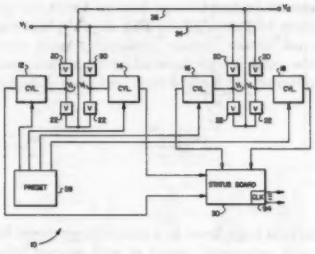
first and second transmission gates, each responsive to a pair of direct and complementary digits, one digit each from either of said first and second sources and either of said first and second inverters, for forming products of said digits, and

means for combining said products into a sum of products equal to the sum of the digits to be added.

4,559,610
GAS PUMPING SYSTEM ANALOG

Cecil R. Sparks, San Antonio; Carl E. Edlund, Castroville, and Morton E. Brown, San Antonio, all of Tex., assignors to Southwest Research Corporation, San Antonio, Tex.

Filed May 4, 1983, Ser. No. 491,358
Int. Cl.[4] G06G 7/57
U.S. Cl. 364—803 21 Claims



1. A system for electrically simulating the acoustical properties of a fluid transfer system, comprising:

means for electrically simulating acoustic properties of fluid piping;

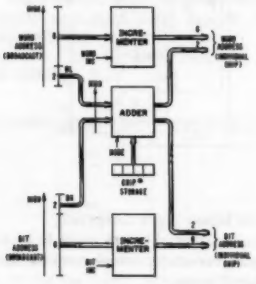
means coupled to said piping simulation means for electrically simulating acoustic properties of fluid transfer through at least one cylinder of a reciprocating compressor, wherein said compressor simulating means includes a variable capacitance means for varying capacitance to simulate varying fluid flow through the compressor piston and cylinder; and

means coupled selectively to said piping simulation means and to said cylinder simulation means for displaying the electrical characteristics analogous to the acoustical properties of the system.

4,559,611
MAPPING AND MEMORY HARDWARE FOR WRITING HORIZONTAL AND VERTICAL LINES

Daniel L. Ostapko, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,697
Int. Cl.[4] G06F 13/00
U.S. Cl. 364—900 5 Claims



1. A system for storing a two-dimensional array of data bits on a plurality of memory chip locations comprising:

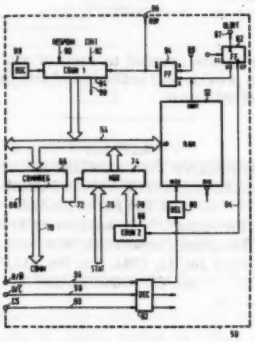
means for storing an array of data bits corresponding to horizontal and vertical lines in a plurality of memory chips wherein said data bits for said horizontal lines are stored in said memory chips in a different sequence than said data bits for said vertical lines,

and means connected to each of said memory chips for reading out said data bits into a serialized output bit stream for a two-dimensional raster-scan display application.

4,559,612
SORTING DEVICE FOR DATA WORDS

Hendrik Vrielink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 535,002
Claims priority, application Netherlands, Oct. 4, 1982, 8203844
Int. Cl.[4] G06F 7/24
U.S. Cl. 364—900 8 Claims



1. A sorting device for data words, comprising a data input for receiving the data words, a memory having an address input to which said data input is coupled and a data input which is activated in a write mode of operation to cause representations of data words received to be stored in said memory, and read control means for reading the representations stored at a sequence of addresses in said memory in order to present the memory address associated with each representation on a data output, characterized in that the sorting device is constructed as an integrated circuit and comprises a bidirectional bus which constitutes the device data input and the data output, a command register coupled to said bus for receiving memeory clear, sorting criterion and pointer reset signals thereform, a counter having its count output coupled to said bus, which counter counts, in a read mode of operation, pulses from an oscillator in order to produce a sequence of addresses of the memory successively on its count output, said counter having inputs coupled to said command register for receiving said sorting criterion and pointer reset signals therefrom as count-determining and set-count signals respectively and a further output for a termination signal, said counter being provided with blocking means for blocking, under the control of the relevant representation, the counting of the oscillator pulses when an address which corresponds to a memory location containing a valid said representation appears on its count output and for producing a ready-to-read signal for a user device when this occurs, means being provided for resetting said blocking means, under the control of a memory read signal, to thereby terminate said blocking after the reading of the complete content of the memory location corresponding to the address currently present on the count output of the counter, means for applying, in said write mode of operation in response to received write commands, write and activation signals to said memory in such manner that each write signal will be delayed relative to the corresponding activation signal so that an intermediate read operation will occur at the same address, an overflow detection circuit for generating an over-

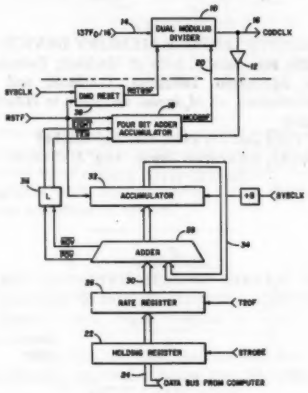
flow signal in response to the reading of a previously stored representation or predetermined number of previously stored representations in such an intermediate read operation, and switch means for applying said termination and overflow signals to the bus as status signals.

4,559,613

DIGITAL FREQUENCY SYNTHESIZER CIRCUIT

John W. Murphy, Cedar Rapids, Iowa, and David K. Vail, Palm Bay, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1982, Ser. No. 393,236
Int. Cl.⁴ H03L *7/18*
U.S. Cl. 364—703 **3 Claims**



1. Apparatus for generating an output signal having a predetermined nominal frequency and including means for shifting the frequency of said output signal by a predetermined amount, said apparatus comprising:

a dual modulus divider circuit having an input connected to receive a pulse signal having a frequency to be divided, and an input connected to receive a first control signal, said divider circuit dividing the pulse signal by an upper divide modulus when the first control signal is enabled and a lower divide modulus when the first control signal is disabled;

a first binary adder/accumulator circuit generating the first control signal as a carry output thereof, said first binary adder/accumulator circuit controlling the ratio and distribution of upper to lower divide modulus cycles of said dual modulus divider circuit, the frequency of occurrence of said control signal being determined by an addend iteratively added in said first binary adder/accumulator circuit at the rate of said output signal, said first binary adder/accumulator circuit having an input connected to receive a second control signal; and

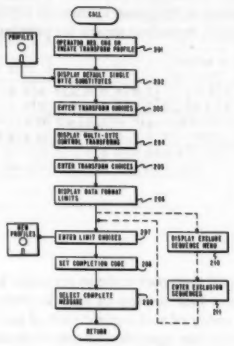
a second binary adder/accumulator circuit having an input connected to receive a data item representative of a frequency shift to be imparted to said output signal, the data item being added iteratively in said second binary adder-/accumulator circuit at a rate less than the rate of said output signal, said second binary adder/accumulator circuit generating the second control signal as a carry output thereof when arithmetic overflow occurs in said second binary adder/accumulator circuit, the second control signal serving to increment the addend of said first binary adder/accumulator circuit for one cycle of said first binary adder/accumulator circuit, thereby shifting the frequency of said output signal.

4,559,614

INTERACTIVE CODE FORMAT TRANSFORM FOR COMMUNICATING DATA BETWEEN INCOMPATIBLE INFORMATION PROCESSING SYSTEMS

Charles L. Peek, Austin; Phillip C. Richey, and James H. Summers, both of Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,513
Int. Cl.⁴ G06F *5/00*
U.S. Cl. 364—900 **8 Claims**



5. In a data communication system including a first information processing system which operates on internal code of a first format and a second information processing system which operates on internal code of a second format different from said first format, a method for interactively transforming the communicated code of said first information processing system to the format of the code of said second information processing system comprising the steps of:

(a) displaying to an operator of the second information processing system a menu of code format transform tasks available for operator selection;

(b) selecting one of said code format transform tasks in response to an operator input to the data communication system;

(c) displaying a transform file of characters and control instructions of said first information processing system together with corresponding default characters and control instructions in the format of the second information processing system;

(d) selectively replacing certain ones of said default characters and control instructions in said transform file with characters and control instructions selected by the operator; and

(e) merging said transform file into a transform program for transforming the communicated code of said first information processing system to the format of the code of said second information processing system.

4,559,615

METHOD AND APPARATUS FOR ENCODING, STORING AND ACCESSING CHARACTERS OF A CHINESE CHARACTER-BASED LANGUAGE

Atkin Y. Goo, 1496 Molehu Dr., Honolulu, Hi. 96818, and Gee-In Goo, 300 Quaint Acres Dr., Silver Spring, Md. 20904

Filed Sep. 15, 1982, Ser. No. 418,461
Int. Cl.⁴ G06F *3/02*; B41J *5/00*
U.S. Cl. 364—900 **12 Claims**

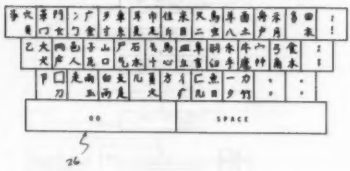
1. A generator for generating Chinese character symbols comprising:

memory means for storing individual characters at memory locations represented by a two-part computer-readable code, the first part defining a predetermined radical ele-

ment common to a plurality of characters, and the second part identifying the stroke forms contained at predetermined locations within the balance of the individual character;

means for fetching said stored characters from said memory means, said fetching means including means for entering into said character generator said two-part code and means for accessing the memory location within said memory means corresponding to said entered two-part code;

input means including a keyboard for controlling said means for fetching in response to manual key-in operations, said input means including means for causing entry of said first



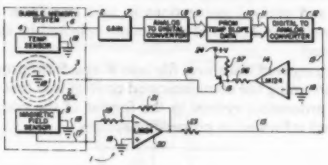
part of said two-part code in response to the operation of a key in a first section of said keyboard and means for causing entry of said second part of said two-part code in response to the operation of one or more keys in a second section of said keyboard, the keys in said first section being operated to select one of said predetermined elements common to a plurality of characters and the keys in said second section being operated to indicate the stroke-form content of the balance of a character, excluding said predetermined common element; and wherein said fetching means also includes means for entering a predetermined code in lieu of said first part, said predetermined code indicating the absence of any said predetermined radical element common to a plurality of characters.

4,559,616

FAST, NON-VOLATILE SEMICONDUCTOR/BUBBLE MEMORY WITH TEMPERATURE-COMPENSATED MAGNETIC BIAS FIELD

John F. Bruder, Phoenix, Ariz., assignor to Quadri Corporation, Tempe, Ariz.

Filed Oct. 3, 1984, Ser. No. 657,194
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—28 **11 Claims**



1. A method of operating a bubble memory system, said method comprising the steps of:

(a) subjecting said bubble memory system to a plurality of different temperatures and, at each of said temperatures, changing a magnetic bias field influencing a bubble memory chip of said bubble memory system to a value that optimizes operation of said bubble memory system in a predetermined manner;

(b) storing digital temperature compensation data numbers representative of the amount of said change of said magnetic bias field at each of said temperatures in individually addressable locations of a memory, respectively;

(c) sensing a temperature indicative of the present temperature of said bubble memory chip during operation of said bubble memory system to produce a first analog signal;

(d) converting said first analog signal to a first digital number representative of the present temperature of said bubble memory chip;

(e) accessing said memory in response to said first digital number to obtain a first one of said temperature compensation data numbers;

(f) converting said first temperature compensation number to an analog output signal representative of the amount of correction needed in said magnetic bias field at said present temperature; and

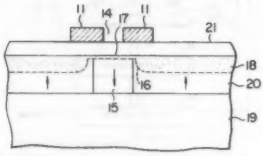
(g) changing said magnetic bias field by a predetermined amount corresponding to the level of said analog output signal.

4,559,617

MAGNETIC BUBBLE MEMORY DEVICE

Toshihiro Sato; Ryo Suzuki, both of Hachioji; Tadashi Ikeda, Kanagawa; Masatoshi Takeshita, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,169
Claims priority, application Japan, Aug. 3, 1983, 58-141229
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—36 **6 Claims**



1. A magnetic bubble device comprising first magnetic bubble propagation tracks formed through ion implantation and second magnetic bubble propagation tracks formed along films of a soft magnetic material, wherein said second magnetic bubble propagation tracks are formed so that a region exclusive of a bubble path on said magnetic material film along which a magnetic bubble is to move is ion-implanted more deeply than said bubble path.

4,559,618

CONTENT-ADDRESSABLE MEMORY MODULE WITH ASSOCIATIVE CLEAR

David L. Houseman, West Chester, Pa., and Paul Bowden, Raleigh, N.C., assignors to Data General Corp., Westborough, Mass.

Filed Sep. 13, 1982, Ser. No. 417,801
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—49 **38 Claims**

1. A content-addressable memory module comprising:

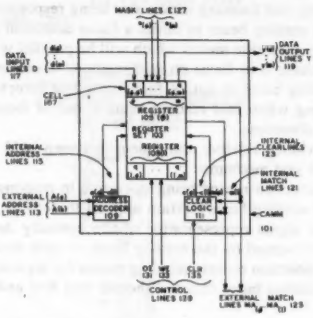
(1) a plurality of register means, each register means of said plurality of register means containing one stored item of data;

(2) means for receiving a pattern item of data;

(3) a plurality of means for detecting said register means containing said stored items of data matching said pattern item of data, each one of said plurality of match detection means being associated with one said register means, being responsive to said stored item of data contained in said one said register means and to said pattern item of data, and providing a match signal when said one said register means associated with said one match detection means contains said stored item of data matching said pattern item of data; and

(4) a plurality of bidirectional match signalling means for providing said match signal from said content-addressable mem-

ory module and receiving said match signal from an external source, each one of said bidirectional match signalling means being associated with one of said register means and responsive to said match signal from said match detection means



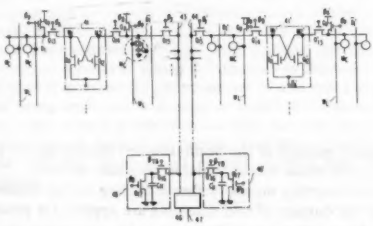
associated with said associated register means and to said match signal from said external source, and acting to provide said match signal only when simultaneously receiving said match signal from said associated match detection means and from said external source.

4,559,619

LARGE CAPACITY MEMORY CIRCUIT WITH IMPROVED WRITE CONTROL CIRCUIT

Hiroaki Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,986
Claims priority, application Japan, Dec. 25, 1981, 56-215269
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—190 **9 Claims**



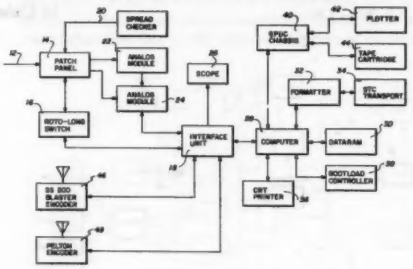
1. A memory circuit comprising first and second bit lines, a plurality of word lines intersecting with said bit lines, a plurality of memory cells arranged at the intersections of said bit lines and word lines, a bus line, a sense amplifier having first and second input nodes, first switching means coupled between said first bit line and said first input node, second switching means coupled between said second bit line and said second input node, third switching means coupled between said bus line and said second input node, first means for operatively enabling said first switching means, second means for operatively enabling said second switching means, third means for selectively enabling said third switching means, and means for controlling said first means, second means and third means such that said second and third switching means are first enabled to determine the state of said sense amplifier by an input signal applied through said bus line with the first switching means disenabled during a single write operation and thereafter said first switching means is enabled to determine the level of said first bit line by said sense amplifier during said single write operation.

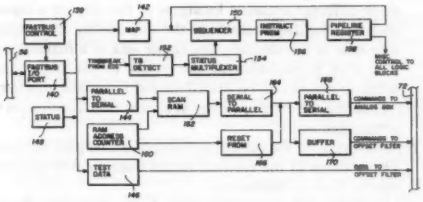
4,559,620

MASS MEMORY SYSTEM ADDRESSING CIRCUIT

Ron B. Blair, Louisville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1982, Ser. No. 418,108
Int. Cl.⁴ G01V *1/22*
U.S. Cl. 367—78 **6 Claims**





1. In a bidirectional high speed data storage system wherein seismic acoustic data may be received in either multiplexed or unmultiplexed form and is written into and read out of a memory, an interface between a computer and a solid state mass memory comprising:

means connected to a data source for receiving data having a plurality of data samples;

means for assigning a memory address to each sample including increment means for skipping a predetermined number of memory addresses between each sample wherein said incremental means includes means for multiplexing said plurality of samples and means for demultiplexing said plurality of samples;

writing means connected to the memory for writing each of said samples into a location in the memory corresponding to its assigned address;

parity signal generating means connected to said writing means for writing for producing a parity bit with each of said samples; and

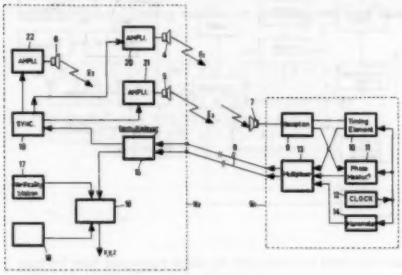
means connected to the memory for reading said samples from the memory in a predetermined sequence, including second increment means for skipping a predetermined number of memory addresses, including means for demultiplexing said samples in said memory, and means for multiplexing said samples in said memory.

4,559,621

TELEMETERING ACOUSTIC METHOD FOR DETERMINING THE RELATIVE POSITION OF A SUBMERGED OBJECT WITH RESPECT TO A VEHICLE AND DEVICE THEREFOR

Robert Deligniéres, Mareil Marly, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 5, 1983, Ser. No. 455,707
Claims priority, application France, Jan. 5, 1982, 82 00042
Int. Cl.[4] G01S *3/80*; G01V *1/38*
U.S. Cl. 367—130 **13 Claims**



1. An acoustic telemetry method for determining the position of an object submerged at great depth with respect to a ship towing the object at the end of a cable, the method comprising:

(a) transmitting acoustic pulses, each from one of at least three different emission locations of the ship, in a manner such that the displacement of the ship during the transmission time is substantially negligible and in a manner such that after propagation of the pulses to the object, said acoustic pulses can be discriminated from one another;

(b) receiving the emitted pulses at a reception location on the submerged object;

(c) measuring on the submerged object the respective propagation times of the emitted pulses from time of transmission to time of reception;

(d) digitizing the measured values to provide data in digitized form;

(e) transmitting the digitized data to the ship, through said cable; and

(f) combining, on board the ship, the different measured values forming said transmitted digitized data, the values of the distances between the emission locations and the values of the time intervals between the transmitted pulses, and determining therefrom in a predetermined manner the coordinates of the submerged object with respect to the ship.

4,559,622

OPTICAL MEMORY SYSTEM PROVIDING IMPROVED FOCUS DETECTION AND CONTROL BY DETECTING REFLECTED BEAM DIAMETER VARIATIONS AT SPACED PREDETERMINED LOCATIONS IN THE SYSTEM

Robert L. Hazel, Thousand Oaks, and Gilbert Y. Chan, Agoura, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 9, 1982, Ser. No. 416,416
Int. Cl.[4] G11B *7/00, 21/10*
U.S. Cl. 369—45 **9 Claims**

1. In an optical storage system including an optical storage medium having optically detectable changes therein representative of stored data, the combination comprising:

data detection means;

focus detection means;

directing and focusing means for directing and focusing a reading beam onto said medium;

said directing and focusing means being responsive to the reflected reading beam to direct at least a portion thereof to said data detection means;

said directing and focusing means also being responsive to the reflected reading beam to direct a focus detection beam to said focus detection means which will be parallel when said reading beam is in focus on said medium, diverging when said reading beam is out of focus in a first direction, and converging when said reading beam is out of focus in the opposite direction;

means providing relative movement between said reading beam and said medium;

said data detection means being operative in response to the reflected reading beam portion applied thereto to produce an output signal representative of the optically detectable changes traversed by the reading beam on said medium;

said focus detection means including means for separating said focus detection beam directed thereto into first and second beams;

said focus detection means also including a first optical detector to which said first beam is directed and a second optical detector to which said second beam is directed, each detector being adapted to intercept only a respective prescribed

peripheral portion of the beam directed thereto and to provide an electrical output signal in response thereto;

said focus detection means further including circuit means to which the outputs of said detectors are applied for producing a focus error signal having a value dependent on the relative values of the detector outputs applied to said circuit means;

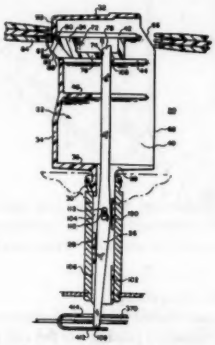
said detectors being located at different optical distances which are chosen in conjunction with said peripheral portions so that when said focus detection beam is diverging said first detector receives a wider beam and said second detector receives a narrower beam than when said focus detection beam is parallel resulting in said first detector intercepting a greater portion and said second detector intercepting a smaller portion than when said focus detection beam is parallel, and when said focus detection beam is converging said first detector receives a narrower beam and said second detector a wider beam than when said focus detection beam is parallel resulting in said first detector intercepting a smaller portion and said second detector intercepting a greater portion than when said focus detection beam is parallel; and

control means coupled to said directing and focusing means for varying the focusing of said reading beam on said medium in response to said focus error signal.

4,559,623
45 RPM AUTOMATIC PLAY ADAPTOR

James T. Dennis, 2312 NW. 57th St., Oklahoma City, Okla. 73112, assignor to James T. Dennis, Oklahoma City, Okla.

Filed May 17, 1984, Ser. No. 611,528
Int. Cl.[4] G11B *17/18*
U.S. Cl. 369—207 24 Claims



1. In an automatic record changer having a rotatable turntable for supporting the records to be played, the combination of, a support body adapted to be positioned concentric with said turntable for supporting a stack of large hole 45 rpm records, means defining a fixed record supporting shelf on said body and integral therewith, means integral with said body diametrically opposite said shelf defining a shoulder having an upwardly and inwardly inclined portion, the distance from the inner edge of said shelf to the outer edge of said shoulder being slightly greater than the hole diameter of a 45 rpm record so that one side of a stack of 45 rpm records placed on said body is supported on said shelf and the other side of the stack is supported on said shoulder, and record ejector means for engaging said one side of the bottom record of the stack and moving it off of said shelf while the other side of the bottom record moves upwardly along said inclined portion of said shoulder to a point at which the distance to the outer edge of said shelf is less than the hole diameter of a 45 rpm record, said shelf being undercut to a point at which the distance to the outer edge of said shoulder is less than the hole diameter of a 45 rpm record, thereby to permit the bottom record ejected from said shelf to move off of said shoulder and onto said turntable.

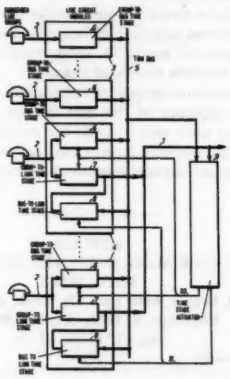
4,559,624
DIGITAL CONCENTRATOR

Sture G. Roos, Linjevägen; Nils U. H. Fagerstedt, Rondellen, and Jens E. Pehrson, Solängsvägen, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00194, § 371 Date Dec. 29, 1983, § 102(e) Date Dec. 29, 1983, PCT Pub. No. WO83/04363, PCT Pub. Date Dec. 8, 1983
PCT Filed May 17, 1983, Ser. No. 574,106
Claims priority, application Sweden, May 26, 1082, 8203278
Int. Cl.[4] H04Q *11/00, 11/04*
U.S. Cl. 370—56 5 Claims

1. In a time-division-multiplex (TDM) communication having a plurality of subscriber lines arranged in a number of subscriber line groups and a plurality of outgoing PCM links, a digital concentrator for TDM channel set-ups from the incoming subscriber lines to the outgoing PCM links comprising:

a TDM bus having a plurality of channels at least equal to the number of subscriber lines in a group but less than the total number of subscriber lines; a plurality of first line circuit modules for connecting some of the subscriber groups to said TDM bus each of said first line circuit modules including a group-to-bus time stage means for setting up a communication between a arbitrary subscriber line of the associated group and an arbitrary channel of said TDM bus, the number of said first line circuit modules on being less than the total number of subscriber line groups whereby only some of said subscriber line groups are directly connected to said TDM bus; a plurality of second line circuit modules for connecting the remaining subscriber line groups to PCM links, each of said second line circuit modules including a group-to-bus time stage means for setting up communication between and arbitrary subscriber line of the associated group of subscriber

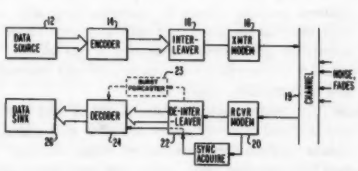


lines and an arbitrary channel of said TDM bus, a group-to-link time stage for setting up communication between an arbitrary subscriber line of said associated group of subscriber lines and an arbitrary channel of the associated PCM link and a bus-to-link time stage for setting up communication between an arbitrary channel of said TDM bus and an arbitrary channel of said associated PCM link; and time stage activation means including means for activating the group-to-bus time stage of a second line circuit module only if a given number of channels of the associated PCM link is busy or otherwise activating the group-to-link time stage of the same second line circuit module.

4,559,625
INTERLEAVERS FOR DIGITAL COMMUNICATIONS

Elwyn R. Berlekamp, and Po Tong, both of Berkeley, Calif., assignors to Cyclotomics, Inc., Berkeley, Calif.

Filed Jul. 28, 1983, Ser. No. 518,213
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—2 17 Claims



1. Digital information system apparatus for communicating information comprising an ordered sequence of i digital words, each said digital word comprising an ordered sequence of n×i symbols, over a channel from an information source to an information destination with improved immunity from noise bursts or fading on said channel, said information source comprising encoder means for algebraically encoding information

units of n symbols and to append one or more characters of redundancy thereto, comprising

(a) interleaver means for reordering said n×i symbols into a helically interleaved sequence of interleaving depth i, i less than n, comprising

(1) interleaver addressing means for assigning to symbols corresponding to the same ordinal position within adjacent words, a time displacement within said helically interleaved sequence of $\alpha i+\beta$ symbols, α and $|\beta|$ each non-zero integers and α and $|\beta|$ greater than or equal one, and

(2) means for forming a time ordered sequence of said helically interleaved symbols,

(b) modulator means for modulating said channel with said time ordered sequence of helically interleaved symbols,

(c) demodulator means for recovering said helically interleaved symbols from said channel,

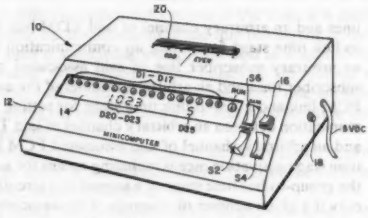
(d) de-interleaver means for re-ordering said helically interleaved sequence in the time inverse re-ordering means whereby each said i words are re-constituted in the respective n symbols thereof, and said words occupy their original ordinal relationship at said information destination.

4,559,626

PORTABLE MINICOMPUTER FOR TESTING MEMORIES

Carleston O. Brown, 4645 Lark Dr, Beale AFB, Calif. 95903

Filed Apr. 5, 1983, Ser. No. 482,127
Int. Cl.⁴ G06F *11/16*
U.S. Cl. 371—21 **13 Claims**



1. A portable minicomputer for testing a random access memory wherein the memory comprises an array of individual memory chips each containing a multitude of address bits, said portable minicomputer comprising:

a central processing unit;

an internal memory connected to said central processing unit;

means for connecting a memory under test to said central processing unit, said central processing unit including an address counter means for incrementing address lines of said internal memory and said memory under test, and means for generating a plurality of test words;

means for writing said test words into said internal memory and said memory under test;

means for reading said test words out of said internal memory and said memory under test after said address counter means reaches a predetermined address count;

means for comparing said test words read out of said internal memory and said memory under test, said last mentioned means including a fault display indicating a discrepancy between test word bits; and

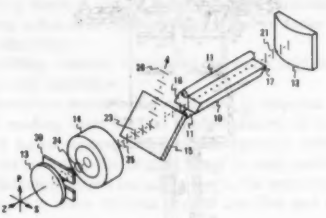
fault conversion means comprising a table of fault display indicia and memory chip addresses for converting a discrepancy identified by said fault display into the address bit location of an individual memory chip in said memory under test.

4,559,627

FACE PUMPED RECTANGULAR SLAB LASER APPARATUS HAVING AN IMPROVED OPTICAL RESONATOR CAVITY

Myung K. Chun, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,676
Int. Cl.⁴ H01S *3/08*
U.S. Cl. 372—92 **13 Claims**



1. A laser apparatus comprising:

A. a slab of a gain medium for producing a beam of coherent electromagnetic radiation passing via the end faces of said slab, a ray entrant at the mid-point of one said end face and exiting at the mid-point of the other said end face defining the optical axis of said apparatus, said slab having a rectangular cross-section in which the plane parallel to the larger lateral face of the slab, passing through said optical axis, defines an "S" plane, and a plane parallel to the smaller lateral face of the slab, and passing through said optical axis, defines a "P" plane;

B. optical pumping means coupled to the larger lateral surfaces of said slab to energize said beam;

C. a resonant optical cavity containing said slab and aligned upon said optical axis for sustaining multiple passes of the rays of said beam via said slab within said cavity, comprising:

(1) a first convex cylindrical mirror optically aligned upon said axis having a finite radius of curvature (R_1) in said "S" plane,

(2) a second concave spherical mirror, optically aligned upon said axis at a distance L from said first mirror, said second mirror having a radius of curvature R_2, where R_2 may include infinity;

said variables R_1, R_2 and L being selected to effect stable resonator beam formation in the dimension of said beam lying in said "P" plane, and unstable resonator beam formation in the dimension of said beam lying in said "S" plane, to provide sufficient gain for lasing and an increased effective active energy extraction volume in said slab for maximum energy extraction.

4,559,628

SHEAR LAYER CONTROL IN A FREE-VORTEX AERODYNAMIC WINDOW

Bruce V. Johnson, Manchester, and Roy N. Guile, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

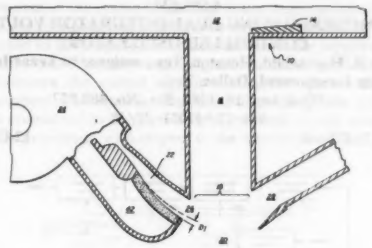
Filed Apr. 26, 1983, Ser. No. 488,838
Int. Cl.⁴ H01S *3/08*
U.S. Cl. 372—104 **4 Claims**

1. An aerodynamic window for use with a gas laser, comprising:

housing means in which said gas laser is positioned, including an exit aperture from which said laser beam passes;

means including a duct for directing a high velocity gas flow

across said exit aperture providing a barrier to isolate the cavity of said gas laser from the atmosphere; and



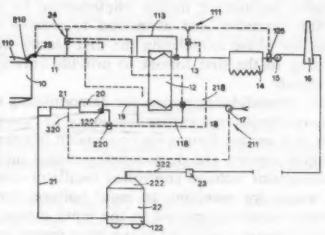
means along said duct for increasing the thickness of the shear boundary layer so that eddies and density variations in the transparent window are minimized.

4,559,629

PROCEDURE AND MEANS FOR PREHEATING SCRAP TO BE CHARGED INTO A SMELTING FURNACE

Egidio Fedele Dell'Oste, Udine, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Sep. 12, 1983, Ser. No. 531,285
Claims priority, application Italy, Sep. 23, 1982, 83450 A/82
Int. Cl.[4] F27D *13/00*
U.S. Cl. 373—80 **20 Claims**



1. A process for preheating scrap to be charged into a smelting furnace with the discharge fumes of the smelting furnace, which is advantageously an arc smelting furnace, characterized by preheating the scrap with clean gas heated through heat exchanger means by discharge fumes taken from the smelting furnace, the clean gas and the discharge fumes being circulated, each of them in its own circuit.

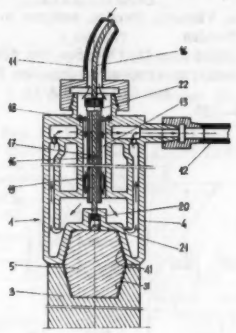
4,559,630

SYSTEM FOR MEASURING THE ARC VOLTAGE IN AN ELECTRIC FURNACE

Pascal Maes, Saint Romain en Giers, France, assignor to Clecim, Courbevoie, France

Filed Oct. 4, 1983, Ser. No. 538,861
Claims priority, application France, Oct. 15, 1982, 82 17253
Int. Cl.[4] H05B *7/07*
U.S. Cl. 373—93 **5 Claims**

1. Apparatus which measures the arc voltage on a graphite electrode having a consumable lower portion (3) joined by a connecting piece (5) to an upper, metal portion (4), being cooled by means of an internal water circulation circuit comprising a supply conduit (11) and a return conduit (12), said apparatus comprising an electrical instrumentation cable (16) electrically connected to said connecting piece (5), passing along the longitudinal axis of said upper, metal portion (4) and



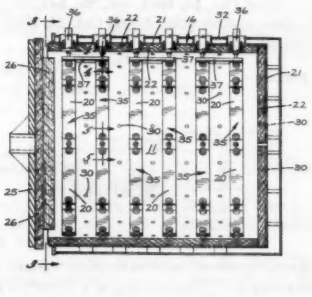
then through the interior of one of said supply conduit (11) and return conduit (12).

4,559,631

HEAT TREATING FURNACE WITH GRAPHITE HEATING ELEMENTS

Craig A. Moller, Loves Park, Ill., assignor to Abar Ipsen Industries, Feasterville, Pa.

Filed Sep. 14, 1984, Ser. No. 651,225
Int. Cl.[4] H05B *3/06*
U.S. Cl. 373—130 **6 Claims**



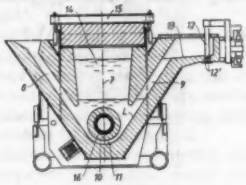
1. An electric heat treating furnace comprising an enclosure having an inner wall of circular cross-section and defining a heating chamber of circular cross-section, a plurality of banks of electric resistence heating elements spaced longitudinally within said chamber, each of said banks comprising a series of at least six rigid and substantially straight elongated bars made of graphite, the graphite bar of each bank being formed separately of every other bar of the bank means connected to one of the bars of each bank for conducting electrical power thereto, means formed separately of said bars for electrically and mechanically interconnecting the bars of each bank, the bars of each bank being approximately equal in length and extending chordwise of said chamber with obtuse and substantially equal included angles between each pair of adjacent bars so that the bars define a substantially regular polygon within the circular chamber.

4,559,632

CHANNEL-TYPE INDUCTION FURNACE OF THE TEAPOT TYPE

Kare Folgero, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 26, 1984, Ser. No. 624,727
Claims priority, application Sweden, Jun. 29, 1983, 830371
Int. Cl.⁴ H05B *5/14*
U.S. Cl. 373—159 **2 Claims**



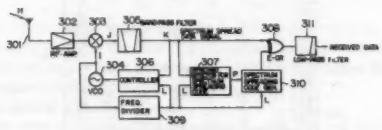
1. A channel-type induction furnace of the teapot type comprising a crucible having a bottom and extending upwardly for containing a melt forming a melt level spaced above said bottom, a channel-type inductor in said bottom and having a partially semi-circular channel opening upwardly into said bottom, and inlet and outlet melt conduits on opposite sides of the crucible and respectively extending at opposite angularities from a level above said melt level to and from said bottom, said conduits being straight and positioned tangentially with respect to said channel and extending straight into and from said channel so that tilting of the furnace towards said outlet conduit permits any melt in the furnace to completely empty from said channel as well as from said crucible.

4,559,633

SPREAD SPECTRUM SYSTEM

Kazutoshi Kan, and Junichi Oizumi, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,023
Claims priority, application Japan, Oct. 22, 1982, 57-184541; Feb. 7, 1983, 58-17325
Int. Cl.⁴ H04L *1/00*
U.S. Cl. 375—1 **12 Claims**



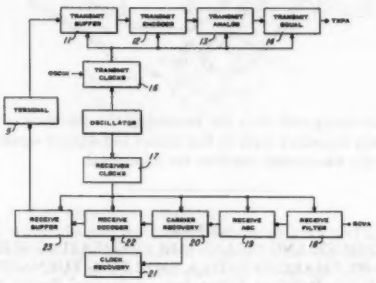
1. A spread-spectrum communication system comprising transmitting means for transmitting as a spectrum spread data signal a carrier modulated with data to be transmitted and a spreading code, and receiving means for receiving the carrier and said spreading code from said transmitting means to demodulate said carrier and said spreading code in synchronism with a local oscillation carrier signal of said receiving means for despreading thereby to reproduce said data, said transmitting means including transmitting clock pulse means for producing a clock pulse for said data and spreading code by dividing said carrier, said transmitting means transmitting said data, spreading code and carrier in synchronism with each other, said receiving means including a first loop circuit means for establishing synchronism between said local oscillation carrier signal and said received carrier and for effecting a synchronous demodulation, receiving clock pulse means for producing a clock pulse for the received spreading code by dividing said local oscillation carrier signal, and a second loop circuit means for establishing synchronism for said spreading code by said clock pulse from said receiving clock pulse means and for despreading the synchronized and demodulated signal from said first loop circuit means to reproduce the data.

4,559,634

PSK MODEM HAVING DUAL-INTEGRATOR VOLTAGE CONTROLLED OSCILLATOR

James R. Hochschild, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,557
Int. Cl.⁴ H04L *27/18*
U.S. Cl. 375—9 **12 Claims**



1. An integrated circuit PSK modem for transmitting and receiving PSK signals derived from digital signals over first and second carrier frequencies respectively, comprising:

(a) transmit encoding means for encoding digital data into a first format for conversion to corresponding PSK signals;

(b) transmit modulating means, implemented in switched capacitor circuitry, and connected to receive the first format, for phase modulating the first carrier frequency according to the first format to provide corresponding PSK signals;

(c) receive demodulating means, for demodulating the PSK signals on the second carrier frequency to provide PSK signals in a second format for conversion to corresponding digital signals, the demodulating means including a dual integrator voltage controlled oscillator comprising input means for receiving an input voltage signal, first integrator means connected to the input means, second integrator means connected to the input means, comparator means having an input connected to the outputs of the first and second integrator means, and a threshold voltage connected to its other input, and switch means, connected at the output of the comparison means and to the first and second integrator means, responsive to the output of the comparator means to switch the first integrator in and the second integrator out of the circuit when the second integrator output reaches the threshold voltage, and vice versa; and

(d) receive decoding means connected to receive the second format for including the second format into corresponding digital signals.

4,559,635

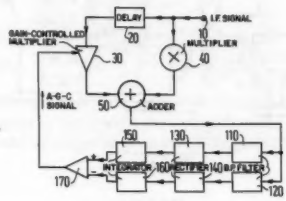
AUTO-ADAPTIVE AMPLITUDE-EQUALIZING ARRANGEMENT FOR DIGITAL RADIO LINKS

Hikmet Sari, Créteil, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1984, Ser. No. 578,251
Claims priority, application France, Feb. 7, 1983, 83 01867
Int. Cl.⁴ H03H *7/03*
U.S. Cl. 375—14 **4 Claims**

1. In an auto-adaptive amplitude-equalizing arrangement for digital radio links comprising, connected in series, an intermediate-frequency signal input terminal, a transversal filter connected to such input terminal for correcting amplitude

distortions of the input signal, and a control circuit for controlling the transversal filter; the control circuit comprising two frequency-selective detectors connected in parallel and respectively centered on two frequencies which are symmetrical with respect to the center frequency of the received intermediate-frequency signal, and a difference amplifier having its input connected to the outputs of the two detectors for supplying to the transversal filter an output signal representing the difference between the output signals of the two detectors; the improvement wherein the transversal filter comprises: a delay circuit connected to the signal input terminal of said arrangement for providing, with respect to the intermediate-frequency



signal input, a delay T equal to $(2k-1)/4F_c$, where k is a positive integer and F_c the center frequency of the intermediate-frequency signal; a first and a second multiplication circuit whose inputs are respectively connected to the output of said delay circuit and to the intermediate-frequency signal output; and an adder connected to the outputs of the first and second multiplication circuits for applying the sum of the signals produced thereby to the input of each of the detectors of the control circuit; the first multiplication circuit being a variable gain amplifying circuit, automatic control of the gain thereof being effected by the output signal of the difference amplifier of the control circuit.

4,559,636

TIME-MEASURING ADAPTER FOR LOGIC ANALYZER

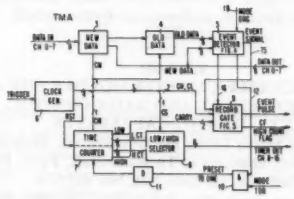
Gottfried Goldrian, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,140

Claims priority, application European Pat. Off., May 24, 1982, 82104508.5

Int. Cl.⁴ G04F *10/00*

U.S. Cl. 377—20 **15 Claims**



1. A method for using a digital device of the type having a plurality of input channel means and storing, in response to a control signal, values of signals applied to said input channel means, comprising the steps of:

coupling a selected subset of said plurality of input channel means to sources of event signals;

applying, to the remaining subset of input channel means, a plurality of signals representative of elapsed time between two consecutive changes of values of an event; and

generating said control signal to store the values applied to said input channel means when any event changes its value.

4,559,637

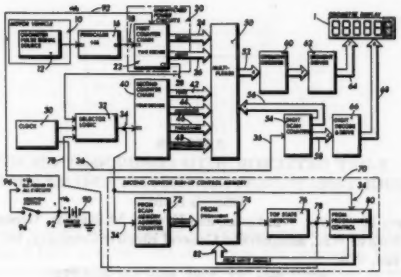
TAMPER PROOF DIGITAL VALUE ACCUMULATOR AND DISPLAY METHOD AND APPARATUS

Harold J. Weber, P.O. Box 315, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Sep. 12, 1983, Ser. No. 531,417

Int. Cl.⁴ H03K *21/30*; G06F *15/20, 11/00*

U.S. Cl. 377—24 **20 Claims**



1. Pulse counting and display storage method for storing an effectively highest successive count value as a progression of substantially permanent incremental storage cell state changes in a programmable memory means, including the steps of:

a. providing a seriate plurality of pulse signals;

b. advancing the effective address states of a memory means by one incremental storage cell location for each provided component pulse signal;

c. entering at least a one bit and substantially permanent memory state change for each addressed said storage cell;

d. counting the effective number of incremental storage cell state changes entered and producing a binary word signal having a value representative of the effectively highest count; and

e. displaying said binary word signal value.

4,559,638

CHARGE TRANSFER DEVICE HAVING AN IMPROVED READ-OUT PORTION

Nathan Bluzer, Silver Spring, and Donald R. Lampe, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 953,808, Oct. 23, 1978, Pat. No. 4,247,788. This application Nov. 3, 1980, Ser. No. 203,092

Int. Cl.⁴ G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 **14 Claims**

1. A charge transfer device for transferring charge packets in a predetermined direction from one potential well to an adjacent potential well and for sensing the value of the charge packet, said device comprising:

a body of semiconductor material of one conductivity type;

a potential well channel of semiconductor material of the opposite conductivity type overlying said body;

a field effect sensing transistor having source and drain regions of a conductivity type opposite that of the potential well channel disposed in said potential well channel, said field effect transistor also including a sensing channel region positioned between the drain and source regions, said regions being disposed serially in said predetermined direction of charge transfer; and

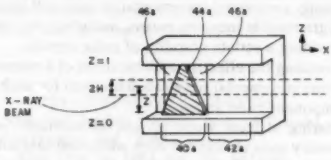
means including the source and drain regions to sense modulating the conductivity of the sensing transistor in response to the charge packets in the potential well channel.

4,559,639

X-RAY DETECTOR WITH COMPENSATION FOR HEIGHT-DEPENDENT SENSITIVITY AND METHOD OF USING SAME

Gary H. Glover, Waukesha, and Edward M. Kerwin, Greendale, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 22, 1982, Ser. No. 443,273
Int. Cl.⁴ G03B *41/16*
U.S. Cl. 378—19 **27 Claims**



1. An x-ray imaging apparatus, comprising:

(a) an x-ray source providing a substantially planar beam of x-ray energy;

(b) an x-ray detector positioned in a spaced-apart relationship from said x-ray source such that an object to be studied may be accomodated therebetween, said x-ray detector having:

(1) a first plurality of detector cells substantially coplanar with said x-ray beam, each of said detector cells including a radiation-receiving aperture having a dimension in a direction orthogonal to the plane of said beam exceeding the thickness of said beam measured in the same direction, said plurality of detector cells containing an x-ray-detecting medium and being disposed for detecting x-ray radiation transmitted through said object;

(2) a second plurality of x-ray detector cells, substantially identical to said first plurality of cells, for detecting a portion of said x-ray radiation beam transmitted past said object without substantial attenuation; and

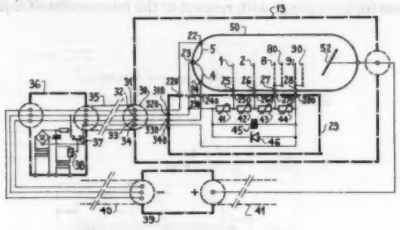
(c) an x-ray attenuative member fixedly disposed between said x-ray source and at least one, but not all, of said second plurality of detector cells, said x-ray member having a variable x-ray transmissive capability in a direction substantially perpendicular to the plane of said x-ray beam for controllably admitting into said one detector cell a predetermined fraction of the total radiation incident thereon in accordance with the position of said x-ray beam on the radiation-receiving aperture of said one cell, as a consequence of which the output thereof exhibits a corresponding dependence on the position of said x-ray beam.

4,559,640

X-RAY TUBE CATHODE MULTIPLE POLARIZATION DEVICE AND A RADIATION SOURCE INCORPORATING SUCH A DEVICE

Jacques Le Guen; Jacques Delair, and André Plessis, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 10, 1982, Ser. No. 387,141
Claims priority, application France, Jun. 12, 1981, 81 11613
Int. Cl.⁴ H05G *1/30*
U.S. Cl. 378—113 **9 Claims**



1. An apparatus for producing X-rays, comprising:

an X-ray tube including:

a protective sheath;

a vacuum-tight envelope disposed in said sheath;

a cathode comprising a plurality of filaments and a plurality of concentrating elements, said cathode disposed in said envelope;

cathode supporting structure means, disposed in said envelope, for mechanically supporting and electrically isolating said plurality of filaments and said plurality of said concentrating elements, said structure means including a plurality of respective electrical terminal means extending outside of said envelope for electrically connecting with said plurality of filaments and said plurality of concentrating elements; and

an anode disposed in said envelope;

polarization voltage generating means for producing a polarization voltage;

voltage divider means, disposed in said protective sheath, electrically connected to said terminal means and to said polarization voltage produced by said generating means, for producing a plurality of fixed predetermined voltage levels and for applying said plurality of fixed voltage levels to said terminal means, said voltage divider means comprising a plurality of active elements; and

high voltage cable means for electrically connecting said generating means to said voltage divider means.

4,559,641

RETRACTABLE CASSETTE HOLDER FOR A RADIOLOGICAL AND RADIOGRAPHIC EXAMINATION APPARATUS

Jean Caugant, Chevilly Larue, and Guy Stephan, Maison Alfort, both of France, assignors to Thomson-CGR, Paris, France

Filed Jun. 15, 1984, Ser. No. 621,076
Claims priority, application France, Jun. 24, 1983, 83 10502
Int. Cl.⁴ G11B *1/00*; G03B *41/16*
U.S. Cl. 378—181 **9 Claims**

1. In a retractable cassette holder for a radiological and radiographic examination apparatus, said apparatus comprising a patient carrying table, a radioactive source situated opposite a first face of the table for subjecting a zone of the patient to irradiation, a luminance amplifier situated opposite the other face of the table directly below the radioactive source for forming a radiological image of the irradiated zone, and a cassette holder which is retractable so as to be insertable between the second face of the table and the luminance amplifier so as to allow, when it is loaded with a radio sensitive cassette,

a radiological image to be formed of the irradiated zone, said cassette holder forms a mobile assembly comprising retracting means for moving said assembly toward and away from said

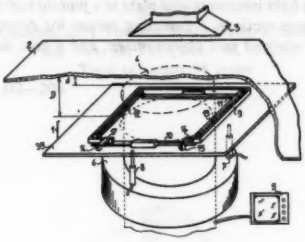


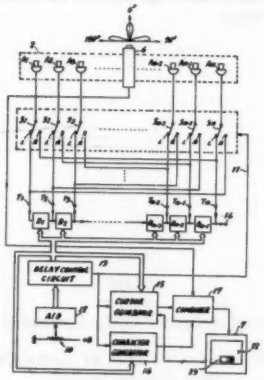
table around said amplifier, means for forming a variable dimension recess in the middle thereof and means for allowing the luminance amplifier to slide inside this recess.

4,559,642

PHASED-ARRAY SOUND PICKUP APPARATUS

Naotaka Miyaji, Yamato; Atsushi Sakamoto, and Makoto Iwahara, both of Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 19, 1983, Ser. No. 524,777
Claims priority, application Japan, Aug. 27, 1982, 57-148883
Int. Cl.⁴ H04R *1/20, 1/40*
U.S. Cl. 381—92 **15 Claims**



1. A phased-array sound pickup apparatus comprising:

an array of directional microphones having individual directivity patterns equally oriented in a given direction, said directivity patterns resulting in a main lobe, each microphone providing a signal;

a plurality of digitally controlled variable delay circuits respectively connected to said array of microphones and responsive to individual signals from said microphones, for introducing incremental delays to said individual signals and combining the delayed signals for delivery as an output of said pickup apparatus; and

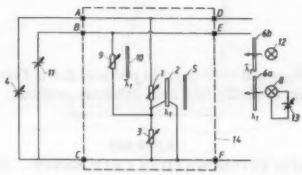
control signal generating means, coupled to said variable delay circuits, for generating a digital delay control signal to control the amount of said incremental delays to cause said main lobe to be steered at an angle to said given direction as a function of said control signal, said control signal generating means including means for generating an adjustable DC voltage, and means for converting said DC voltage into a binary code.

4,559,643

OPTO-ELECTRONIC IMAGE PROCESSOR

Torgny Brogardh, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Oct. 15, 1982, Ser. No. 434,557
Claims priority, application Sweden, Oct. 19, 1981, 8106174
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—1 **15 Claims**



1. A device for receiving and processing optical information, varying at least in at least one dimension, the processing being adapted to be carried out by at least one electro-optical modulator means, and photo-detector means, said modulator means and said photo-detector means being electrically connected together with other components to obtain circuits with electro-optical feedback in which at least one of said optical modulator means is present in the ray path between an optical source of information and at least one of said photo-detector means, and wherein said optical modulator means is present for processing the optical information and in which at least said one photo-detector means is electo-optically feedback-coupled to at least said one optical modulator means, said circuits with electro-optical feedback are adapted to be switched by optical sensing of a property of the light in and between, respectively, spatially separated regions of an optical image, said switching being adapted to be carried out between different light transmission states of said one light modulator means when said sensed property of the light reaches predetermined values, and that the light transmission states of said circuits with electro-optical feedback are adapted to be sensed optically with at least one other of said at least one photo-detector means, said one other photo-detector means being separated from the electro-optical circuits.

4,559,644

IMAGE PROCESSING APPARATUS AND METHOD FOR RECOGNIZING ONLY DESIRED PATTERNS

Hiroyuki Kataoka, and Yoshio Arai, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 461,711
Claims priority, application Japan, Jan. 29, 1982, 57-11716
Int. Cl.⁴ G06K *9/18*
U.S. Cl. 382—9 **6 Claims**

1. A method for selectively reading, processing and recording data images from an original document, comprising the steps of:

printing on an original document image data desired to be recognized with solid lines and printing image data desired to not be recognized as optically fine discontinuous lines, wherein said discontinuous lines comprise optically fine discontinuous patterns and wherein said patterns are substantially smaller than said discontinuous lines;

scanning said original document in a raster scanning pattern with a photoelectric image sensor; and

recognizing in an analog output signal from said photoelec-

tric image sensor signal portions which correspond to a printed optically fine discontinuous pattern and eliminating from said analog signal portions thereof corresponding to said optically fine discontinuous patterns.

4,559,645

IMAGE INFORMATION PROCESSING DEVICE

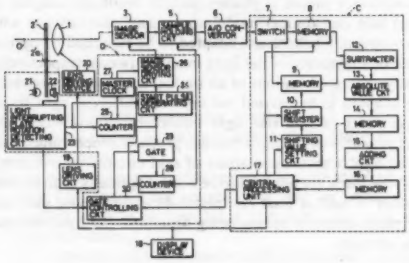
Yoshiaki Horikawa, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,361

Int. Cl.[4] G06K 9/58

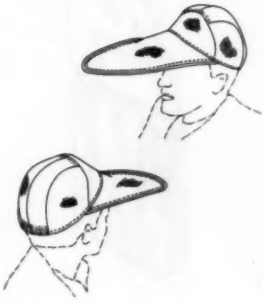
U.S. Cl. 382—65 **2 Claims**

1. An image information processing device comprising an image-forming optical system having a light interrupting plate with a plurality of transparent and opaque sections for forming an object image, an image pickup device arranged in a predetermined position apart from said image-forming optical system, a sample holding circuit connected to said image pickup device to sample and hold the output from said image pickup device, said object image including therein a substantially stationary state and a transitionary state, wherein said substantially stationary state occurs when light passes through said transparent sections of said plate, and said transitionary state occurs when light intersects said plate at a juncture of transparent and opaque sections, a detecting means for detecting the transitionary state of said object image, and a gate means for controlling the supply of a sampling signal to said sample holding circuit, said gate means being operated so that the sampling signal is not supplied to said sample holding circuit to thereby inhibit the sampling of the output signal from said image pickup device corresponding to the transitionary state of the object image and wherein said output signal occurs just after said detecting means has detected the transitionary state of the object image.

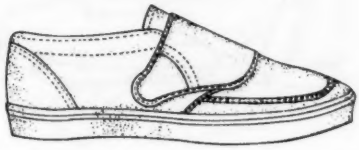


281,732
SHIRT
Jack S. Conklin, 2371 Ventura Blvd., Oxnard, Calif. 93030
Filed Nov. 18, 1983, Ser. No. 553,309
Term of patent 14 years
U.S. Cl. D2—208

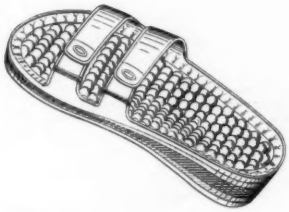
281,733
CAP
Lawrence D. Robinson, Jr., 6517 Whitworth, Los Angeles, Calif. 90035
Filed Mar. 14, 1983, Ser. No. 474,758
Term of patent 14 years
U.S. Cl. D2—244



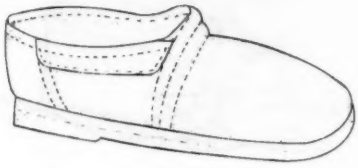
281,734
STRAP POCKETED SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 436,562, Oct. 25, 1982. This application Jul. 5, 1983, Ser. No. 510,562
Term of patent 14 years
U.S. Cl. D2—269



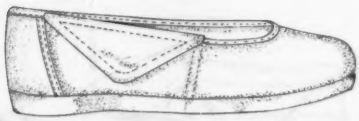
281,735
FOOT MASSAGING SANDAL
Charles J. Seltzer, 17 Autumn Dr., Danbury, Conn. 06810
Filed Apr. 11, 1983, Ser. No. 483,860
Term of patent 14 years
U.S. Cl. D2—293



281,736
POCKETED CASUAL GYMNASTIC AND AEROBIC SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 408,650, Aug. 16, 1982, which is a continuation-in-part of Ser. No. 314,136, Oct. 23, 1981, and a continuation-in-part of Ser. No. 116,279, Jan. 18, 1980, Pat. No. Des. 261,695, which is a continuation-in-part of Ser. No. 938,098, Aug. 30, 1978, abandoned. This application Jun. 6, 1983, Ser. No. 501,657
Term of patent 14 years
U.S. Cl. D2—301

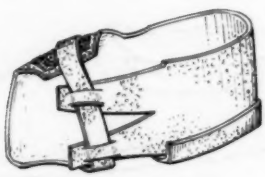


281,737
POCKETED SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 501,657, Jun. 6, 1983. This application Aug. 5, 1983, Ser. No. 520,696
Term of patent 14 years
U.S. Cl. D2—301



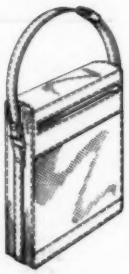
281,738
ATHLETIC SHOE FOR KICKER
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Aug. 1, 1983, Ser. No. 519,037
Term of patent 14 years
U.S. Cl. D2—311

281,739
SHOE PROTECTOR
Willie J. Hazley, 637 Spring Oaks Blvd., Altamonte Springs, Fla. 32701
Filed Jul. 5, 1983, Ser. No. 510,647
Term of patent 14 years
U.S. Cl. D2—314

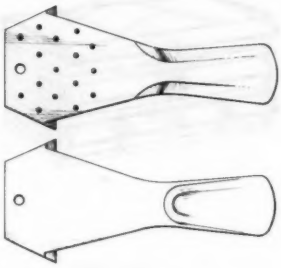


281,740
CARRYING CASE FOR A CAMERA AND ACCESSORIES
Theodore E. Rodrigues, 15 Cottonwood Dr., San Rafael, Calif. 94901
Filed Oct. 17, 1983, Ser. No. 542,381
Term of patent 14 years
U.S. Cl. D3—33

281,741
LUGGAGE
Ira R. Katz, Nashville, and Robert P. Davis, Lebanon, both of Tenn., assignors to Hartmann Luggage Company, Lebanon, Tenn.
Division of Ser. No. 25,806, Apr. 2, 1979, Pat. No. Des. 266,971. This application Jul. 27, 1981, Ser. No. 550,861
Term of patent 14 years
U.S. Cl. D3—48



281,742
COMBINED CLEANER FOR SPIKED SHOES AND SHOEHORN
Edillio Pagnini, 381 S. Main St., Hopedale, Mass. 01747
Filed Jul. 22, 1983, Ser. No. 516,781
Term of patent 14 years
U.S. Cl. D4—116

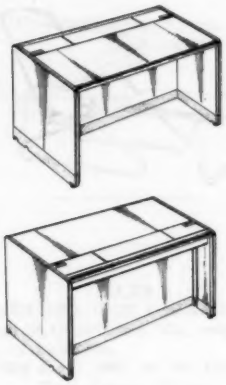


281,743
TOILET BRUSH & HOLDER THEREFOR
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, Australia
Filed Dec. 3, 1982, Ser. No. 446,859
Claims priority, application Australia, Oct. 12, 1982, 1820/82
Term of patent 14 years
U.S. Cl. D4—121

281,744
CHAISE LOUNGE
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Jul. 5, 1983, Ser. No. 511,050
Term of patent 14 years
U.S. Cl. D6—361

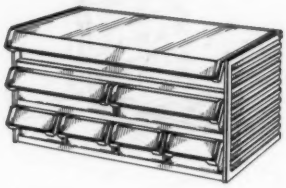
281,745
CRIB
Wayne Pandorf, 7 Baywood Dr., Ormond Beach, Fla. 32074, and Warren Pandorf, 6131 NW. 30th Ter., Gainesville, Fla. 32601
Filed Jun. 15, 1983, Ser. No. 504,408
Term of patent 14 years
U.S. Cl. D6—390

281,746
DESK
Seiji Koguma, Itabashi, Japan, assignor to Okamura Corporation, Yokohama, Japan
Filed Feb. 3, 1983, Ser. No. 463,392
The portion of the term of this patent subsequent to Apr. 30, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—426



281,747
TABLE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jul. 11, 1983, Ser. No. 512,337
Term of patent 14 years
U.S. Cl. D6—430

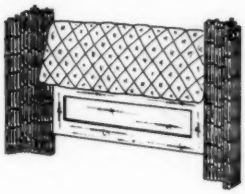
281,748
STORAGE UNIT
Heikki Kiiski, Turku, Finland, assignor to Treston Oy, Turku, Finland
Filed Apr. 18, 1983, Ser. No. 485,602
Claims priority, application Finland, Dec. 3, 1982, 821056
Term of patent 14 years
U.S. Cl. D6—446



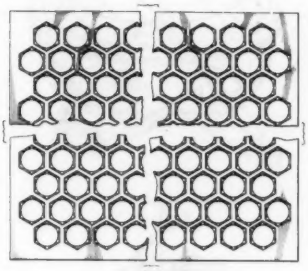
281,749
BASE FOR A TABLE OR THE LIKE
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Jul. 22, 1983, Ser. No. 517,088
Term of patent 14 years
U.S. Cl. D6—499

281,750
CAMERA CASE
Jun Akabane, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,847
Claims priority, application Japan, Jan. 31, 1983, 58-3368
Term of patent 14 years
U.S. Cl. D3—33

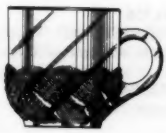
281,751
HEADBOARD FOR A BED
Carlo Giorgetti, Meda-Milan, Italy, assignor to Giorgetti S.p.A, Milan, Italy
Filed Mar. 16, 1983, Ser. No. 475,849
Claims priority, application Italy, Sep. 16, 1982, 22913 B/82
Term of patent 14 years
U.S. Cl. D6—505

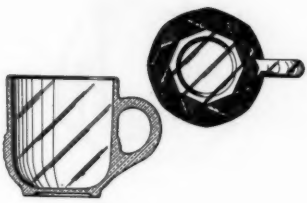


281,752
FLOOR MAT
David R. Dickens, Lincoln; Waldo Smith, Warwick, and Herbert Malin, Barrington, all of R.I., assignors to Teknor Apex Company, Pawtucket, R.I.
Filed Mar. 14, 1983, Ser. No. 475,350
Term of patent 14 years
U.S. Cl. D6—582

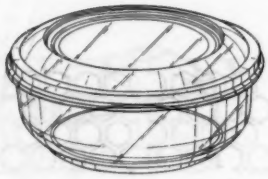


281,753
CUP OR SIMILAR ARTICLE
Jean-Jacques Durand, La Bute, Chemin de la Garenne, 62510 Arques, France
Filed Aug. 16, 1983, Ser. No. 523,580
Term of patent 14 years
U.S. Cl. D7—9

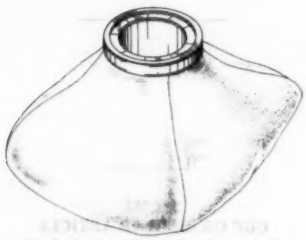




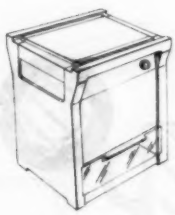
281,754
ENCLOSED CONTAINER
Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.
Filed Jan. 13, 1983, Ser. No. 457,709
Term of patent 14 years
U.S. Cl. D7—17



281,755
HOLDER FOR DRINKING VESSEL
Brian D. Bradley, 5144 N. 69th Pl., Scottsdale, Ariz. 85253
Filed Dec. 9, 1982, Ser. No. 448,178
Term of patent 14 years
U.S. Cl. D7—45

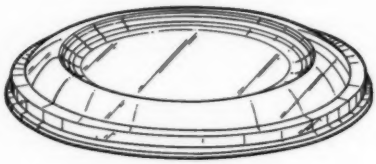


281,756
COMBINED FOOD CARRIER AND WARMER
Richard H Seager, Mystic, Conn., assignor to Temp-Tech Co., Inc., Springfield, Mass.
Filed Jul. 22, 1982, Ser. No. 400,852
Term of patent 14 years
U.S. Cl. D7—77



281,757
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 27, 1982, Ser. No. 437,018
Claims priority, application Fed. Rep. of Germany, May 10, 1982, MR 176
Term of patent 14 years
U.S. Cl. D7—321

281,758
RESEALABLE CLOSURE FOR A CONTAINER
Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.
Filed Jan. 13, 1983, Ser. No. 457,708
Term of patent 14 years
U.S. Cl. D7—387



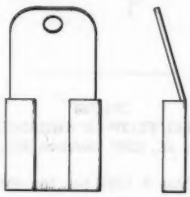
281,759
FLOOR TILE REMOVING TOOL
David J. Filippini, 1939 Laredo Ct., Stockton, Calif. 95209
Filed Aug. 2, 1982, Ser. No. 404,441
Term of patent 14 years
U.S. Cl. D8—14

281,760

SNAP TOP BEVERAGE CAN OPENER

A. Michael Doring, 107 N. Wortman Pl., Claremore, Okla. 74017, and Douglas P. Hansen, 6242 E. 100, Jenks, Okla. 74037

Filed Apr. 1, 1983, Ser. No. 481,492
Term of patent 14 years
U.S. Cl. D8—18



281,761

FORCE INDICATING UNIT FOR TORQUE WRENCH

Bosko Grabovac, Arcadia, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.

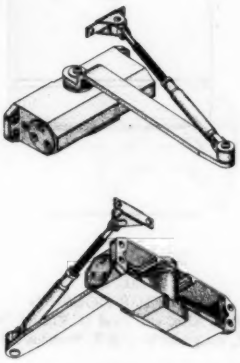
Filed Jan. 20, 1983, Ser. No. 449,477
Term of patent 14 years
U.S. Cl. D8—24

281,762

DOOR CLOSER

Mitsuaki Okazaki, Fuchu, Japan, assignor to Ryobi Limited, Hiroshima, Japan

Filed Sep. 26, 1983, Ser. No. 535,942
Claims priority, application Japan, Apr. 22, 1983, 58-17358
Term of patent 14 years
U.S. Cl. D8—330

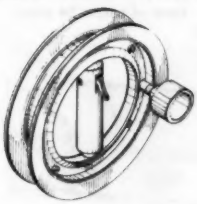


281,763

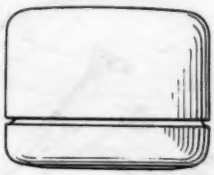
REEL FOR KITES AND THE LIKE

Gary R. Smith, 429 Harrison St., Port Townsend, Wash. 98368

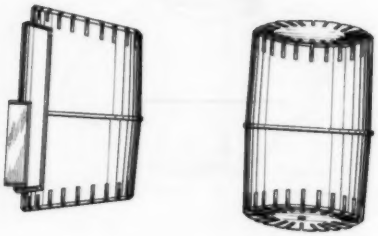
Filed Jul. 21, 1983, Ser. No. 516,174
Term of patent 14 years
U.S. Cl. D8—359



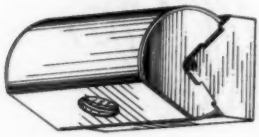
281,764
JAR
Pietro Legrottaglie, Novate Milanese, Italy, assignor to Carlo Reggiani S.p.A., Tradate, Italy
Filed Oct. 18, 1982, Ser. No. 434,964
Claims priority, application Italy, Apr. 22, 1982, 21655/82[U]
Term of patent 14 years
U.S. Cl. D9—352



281,765
DETECTOR HOUSING
Jack P. Hall, Palo Alto, and Paul D. Kardel, Mountain View, both of Calif., assignors to C & K Systems Inc., Santa Clara, Calif.
Filed Oct. 19, 1983, Ser. No. 543,394
Term of patent 14 years
U.S. Cl. D10—106



281,766
SENSOR UNIT
Arthur M. Denton, Charlotte, and Fred M. Mills, Mount Pleasant, both of N.C., assignors to Keane Monroe Corporation, Monroe, N.C.
Filed Jun. 1, 1983, Ser. No. 500,235
Term of patent 14 years
U.S. Cl. D10—106

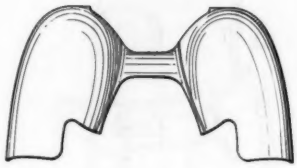


281,767
EARRING
Harry N. Mason, 1900 Green St., San Francisco, Calif. 94123
Filed Aug. 25, 1983, Ser. No. 526,398
Term of patent 14 years
U.S. Cl. D11—78

281,768
ARTIFICIAL FLOWER ARRANGEMENT
H. Roland Hansen, Jr., 1240 Doremus Rd., Pasadena, Calif. 91105
Filed May 9, 1983, Ser. No. 493,003
Term of patent 14 years
U.S. Cl. D11—117

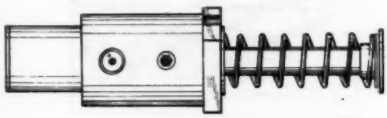
281,769
SNOW SAIL SLED
Peter C. Newton, R.R. #1, Collingwood, Ontario, Canada L9Y 3Y9
Filed Nov. 29, 1982, Ser. No. 445,318
Claims priority, application Canada, Jun. 4, 1982, 04-06-82-6
Term of patent 14 years
U.S. Cl. D12—9

281,770
MOTORCYCLE MANIFOLD COVER
Alwin J. Stahel, St. Paul, and Thomas H. Rudd, Wayzata, both of Minn., assignors to Drag Specialties, Inc., Minneapolis, Minn.
Filed Mar. 23, 1983, Ser. No. 478,418
Term of patent 14 years
U.S. Cl. D12—126

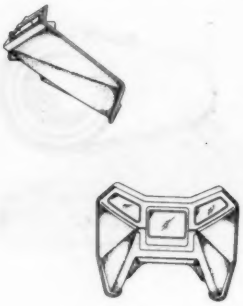


281,771
FOLDING WHEELED WALKER
Shirley B. Webb, 814-B Parker Dr., Florence, S.C. 29501
Filed Jul. 5, 1983, Ser. No. 510,745
Term of patent 14 years
U.S. Cl. D12—130

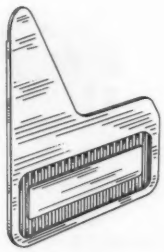
281,772
HYDRAULIC SHOCK ABSORBER
Robert J. Heideman, Westland, and Richard G. Dressell, Jr., Livonia, both of Mich., assignors to Enertrols, Inc., Farmington Hills, Mich.
Filed Feb. 2, 1983, Ser. No. 463,186
Term of patent 14 years
U.S. Cl. D12—159



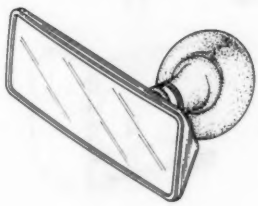
281,773
MOTORCYCLE FAIRING
Fred O. Hoese, 30706 Wildcat Dr., Bulverde, Tex. 78163
Filed Jun. 11, 1982, Ser. No. 387,355
Term of patent 14 years
U.S. Cl. D12—182



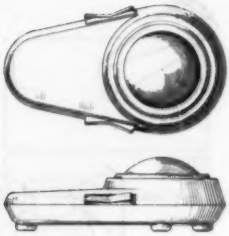
281,774
VEHICLE SPLASH GUARD
Douglas K. Ward, Toronto, Canada, assignor to Powerflow, Inc., Buffalo, N.Y.
Filed May 19, 1983, Ser. No. 496,269
Term of patent 14 years
U.S. Cl. D12—185



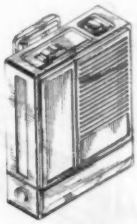
281,775
PORTABLE MIRROR FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Company, Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,864
Term of patent 14 years
U.S. Cl. D12—187



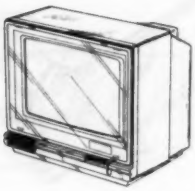
281,776
REMOTE CONTROL HEMISPHERE SWITCH
James L. Griffin, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Nov. 21, 1983, Ser. No. 554,020
Term of patent 14 years
U.S. Cl. D13—32



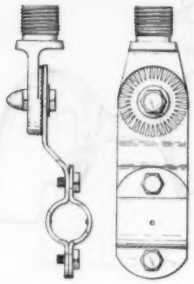
281,777
RADIO RECEIVER
Takeshi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Aug. 22, 1983, Ser. No. 525,206
Claims priority, application Japan, Feb. 21, 1983, 58-6830
Term of patent 14 years
U.S. Cl. D14—68



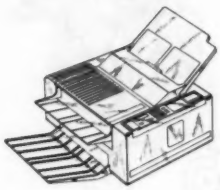
281,778
TELEVISION RECEIVER
Shigeki Gushiken; Hiroyuki Kogane; Masahide Aoki, all of Tokyo; Toru Kiyota, Tachikawa, and Takashi Fujii, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 18, 1983, Ser. No. 524,249
Claims priority, application Japan, Apr. 27, 1983, 58-17604
Term of patent 14 years
U.S. Cl. D14—80



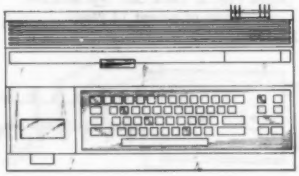
281,779
ANTENNA RAILING MOUNT
Donald G. Lilly, 9 Woodmere Dr., Northport, N.Y. 11768
Filed Sep. 15, 1983, Ser. No. 532,533
Term of patent 14 years
U.S. Cl. D14—91



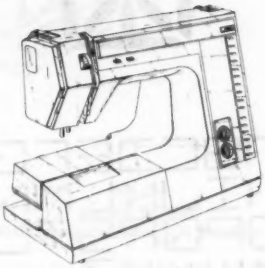
281,780
FACSIMILE TRANSCEIVER
Akitaka Takeuchi, Kodaira; Takeshi Abe, Tokyo, and Hiroshi Endo, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 15, 1983, Ser. No. 523,089
Claims priority, application Japan, Mar. 25, 1983, 58-12006
Term of patent 14 years
U.S. Cl. D14—94



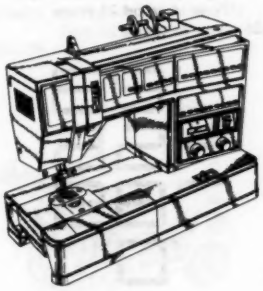
281,781
COMPUTER
José Henrard, Paris, France, assignor to Thomson-Brandt, Paris, France
Filed Mar. 22, 1983, Ser. No. 477,784
Claims priority, application France, Sep. 22, 1982, 823198
Term of patent 14 years
U.S. Cl. D14—100



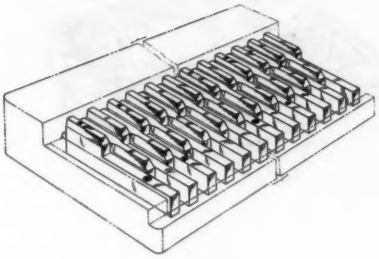
281,782
SEWING MACHINE
Yoshiaki Eguchi, Higashimurayama, Japan, assignor to Janome Sewing Maching Co. Ltd., Tokyo, Japan
Filed Feb. 7, 1983, Ser. No. 464,735
Claims priority, application Japan, Dec. 17, 1982, 57-56406
Term of patent 14 years
U.S. Cl. D15—69



281,783
SEWING MACHINE OR SIMILAR ARTICLE
Jeanne K. Allen, New York, N.Y., assignor to The Singer Company, Stamford, Conn.
Filed Jul. 18, 1983, Ser. No. 514,722
Term of patent 14 years
U.S. Cl. D15—69

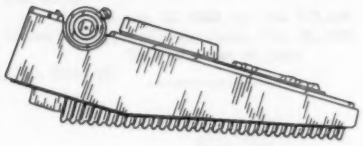


281,784
SIGHT-TRANSPOSING ENABLING KEYBOARD FOR MUSICAL INSTRUMENTS
James A. Tabor, 260 Arrowhead Pl., Stratford, Conn. 06497
Filed Jul. 14, 1982, Ser. No. 398,330
Term of patent 14 years
U.S. Cl. D17—9

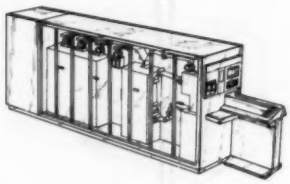


281,785
PERCUSSION INSTRUMENT
Michael H. Balter, 4122 Bristol Ct., Northbrook, Ill. 60062, and Louis P. Bellson, P.O. Box 1560, Lake Havasu City, Ariz. 86403
Filed Nov. 17, 1983, Ser. No. 552,728
Term of patent 14 years
U.S. Cl. D17—22

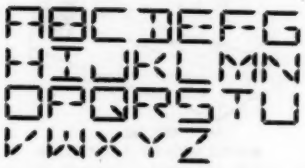
281,786
PORTABLE ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Oct. 13, 1983, Ser. No. 541,565
Claims priority, application Italy, Apr. 13, 1983, 53199/83[U]
Term of patent 14 years
U.S. Cl. D18—1



281,787
BANK NOTE EXAMINING MACHINE
Yoshiaki Nishida, Omorinishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 1, 1983, Ser. No. 510,247
Claims priority, application Japan, Jan. 25, 1983, 58-2310
Term of patent 14 years
U.S. Cl. D18—3

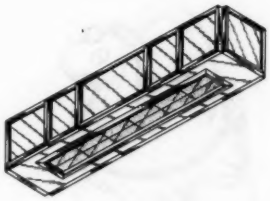


281,788
ALPHABET FONT
Jon B. Albert, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 15, 1983, Ser. No. 522,965
Term of patent 14 years
U.S. Cl. D18—26



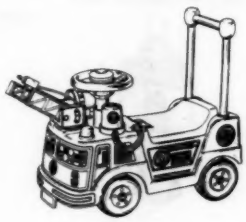
281,789
NUMERAL FONT
Jon B. Albert, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 15, 1983, Ser. No. 523,080
Term of patent 14 years
U.S. Cl. D18—26

281,790
ILLUMINATED HANGING SIGN CABINET
William A. Cobbe, Williamsburg, Ohio, assignor to Dualite, Inc., Williamsburg, Ohio
Filed Nov. 17, 1983, Ser. No. 552,786
Term of patent 14 years
U.S. Cl. D20—10

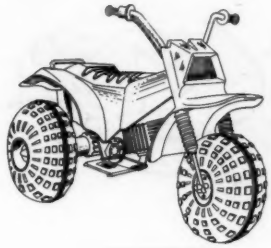


281,791
GAME BOARD
Richard G. Dobrzynski, P.O. Box 156, Franklin Furnace, Ohio 45629
Filed Sep. 30, 1982, Ser. No. 431,140
Term of patent 14 years
U.S. Cl. D21—34

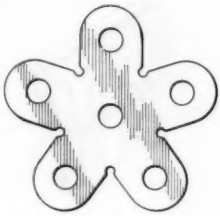
281,792
TOY VEHICLE
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Oct. 31, 1983, Ser. No. 547,282
Claims priority, application Japan, May 18, 1983, 58-20778
Term of patent 14 years
U.S. Cl. D21—78



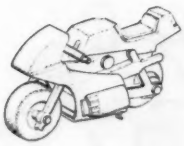
281,793
TOY MOTORCYCLE
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Pines of America, Inc., Fort Wayne, Ind.
Filed Sep. 28, 1983, Ser. No. 536,764
Term of patent 14 years
U.S. Cl. D21—80



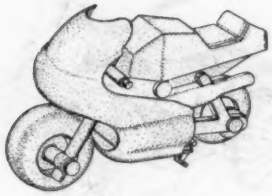
281,794
TOY CONSTRUCTION PIECE
Roy M. Short, R.R. #2, Box 108, Arba Rd., Lynn, Ind. 47355
Filed Oct. 24, 1983, Ser. No. 544,693
Term of patent 14 years
U.S. Cl. D21—108



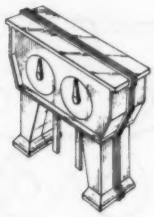
281,795
TOY MOTORCYCLE
Toshimasa Shimomura, Toyonaka, Japan, assignor to Tonan Merchandise Inc., Osaka, Japan
Filed Jan. 13, 1984, Ser. No. 570,531
Term of patent 14 years
U.S. Cl. D21—134



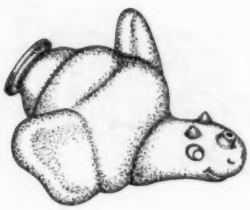
281,796
TOY MOTORCYCLE
Toshimasa Shimomura, Toyonaka, Japan, assignor to Tonan Merchandise Inc., Osaka, Japan
Filed Jan. 13, 1984, Ser. No. 570,532
Term of patent 14 years
U.S. Cl. D21—134



281,797
LAP COUNTER FOR COUNTING THE PASSAGE OF TOY VEHICLES ALONG A TRACK
Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong
Filed Nov. 8, 1982, Ser. No. 440,207
Claims priority, application United Kingdom, May 19, 1982, 1006795
Term of patent 14 years
U.S. Cl. D21—143

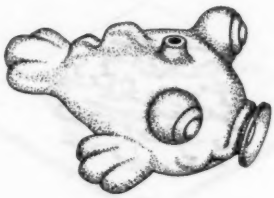


281,798
TOY SNAIL
James E. Routzong, Beverly, and Frank D. Ventura, Newburyport, both of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Sep. 22, 1983, Ser. No. 534,843
Term of patent 14 years
U.S. Cl. D21—148



281,799
TOY DRAGON
James E. Routzong, Beverly, and Frank D. Ventura, Newburyport, both of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Sep. 22, 1983, Ser. No. 534,850
Term of patent 14 years
U.S. Cl. D21—148

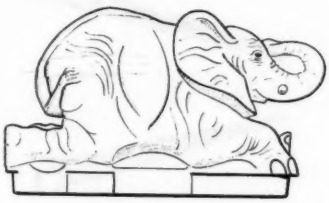
281,800
TOY FISH
James E. Routzong, Beverly, and Frank D. Ventura, Newburyport, both of Mass., assignors to CPR Products Corp., Minneapolis, Minn.
Filed Sep. 22, 1983, Ser. No. 534,842
Term of patent 14 years
U.S. Cl. D21—157



281,801
DOLL
Chang A. Koh, 12-1, Bonseong Dong, Jinju, Kyung Sang Namdo, Rep. of Korea
Continuation of Ser. No. 608,538, May 9, 1984, which is a continuation of Ser. No. 390,670, Jun. 21, 1982. This application Dec. 21, 1984, Ser. No. 684,171
Claims priority, application Rep. of Korea, Dec. 19, 1981, 10023/1981
Term of patent 14 years
U.S. Cl. D21—169

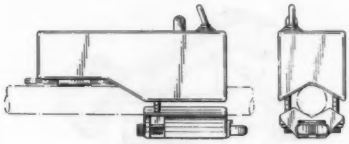
281,802
HAND EXERCISE DEVICE
Eliot Gordon, 2860 S. Ocean Blvd., Palm Beach, Fla. 33480
Filed Oct. 31, 1983, Ser. No. 547,242
Term of patent 14 years
U.S. Cl. D21—198

281,803
ELEPHANT FIGURE PLAYGROUND CLIMBER
James E. Miller, Birmingham, Mich., assignor to Wausau Tile, Inc., Wausau, Wis.
Filed Jul. 25, 1983, Ser. No. 516,723
Term of patent 14 years
U.S. Cl. D21—245



281,804
PISTOL TELESCOPE MOUNT
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Aug. 8, 1983, Ser. No. 521,099
Term of patent 14 years
U.S. Cl. D22—7

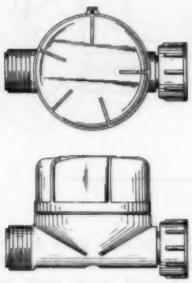
281,805
FISHING LINE STRIKE INDICATOR
Daryll B. Bolinger, 25840 Hayes, Roseville, Mich. 48066
Filed Apr. 15, 1983, Ser. No. 485,305
Term of patent 14 years
U.S. Cl. D22—23



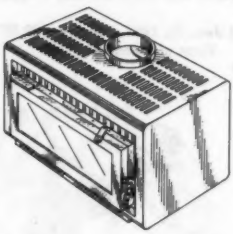
281,806
FISHING LURE
Roy E. Greer, 3317 Stonecrest Cir., Plano, Tex. 75074
Filed Jul. 11, 1983, Ser. No. 512,464
Term of patent 14 years
U.S. Cl. D22—27

281,807
LURE
Howard Shiverdecker, Lot 132, Park City South, Bloomington, Ill. 61701
Filed Jun. 30, 1983, Ser. No. 509,297
Term of patent 14 years
U.S. Cl. D22—28

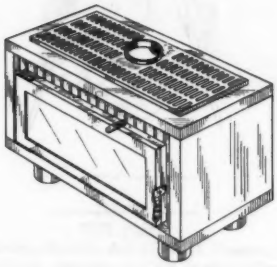
281,808
TIMER-SHUT OFF VALVE
Jack L. Lemkin, Cincinnati; Eugene A. Zilber, and Carl A. Peterson, both of Columbus, all of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Apr. 8, 1983, Ser. No. 483,153
Term of patent 14 years
U.S. Cl. D23—38



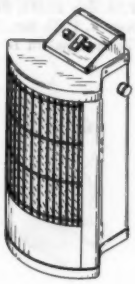
281,809
HEATER
Peter F. Haythornthwaite, Auckland, New Zealand, assignor to The Stack Manufacturing Company Limited, Auckland, New Zealand
Filed Feb. 4, 1983, Ser. No. 463,898
Term of patent 14 years
U.S. Cl. D23—97



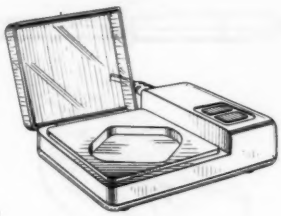
281,810
HEATER
Peter F. Haythornthwaite, Auckland, New Zealand, assignor to The Stack Manufacturing Company Limited, Auckland, New Zealand
Filed Feb. 4, 1983, Ser. No. 463,897
Term of patent 14 years
U.S. Cl. D23—97



281,811
SPACE HEATER
Paul V. Horst, Sr., Boulder, Colo., assignor to Crockett & Kelly, Inc., Erie, Colo.
Continuation-in-part of Ser. No. 434,069, Oct. 13, 1982, Pat. No. Des. 277,780. This application Jan. 6, 1983, Ser. No. 455,936
Term of patent 14 years
U.S. Cl. D23—122



281,812
CONTACT LENS HEATING DEVICE
Richard M. Franczak, Laurence Harbor, N.J., and Joseph N. Casale, Brooklyn, N.Y., assignors to Barnes-Hind, Inc., Sunnyvale, Calif.
Filed May 20, 1983, Ser. No. 496,754
Term of patent 14 years
U.S. Cl. D24—9



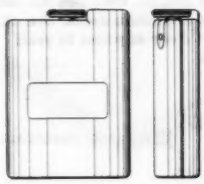
281,813
DENTAL COMPOSITE UNIT DOSE CONTAINER WITH BREAKAWAY MIXING STICK
Robert D. Holewinski, Lakehurst; Leslie Hamilton, Trenton, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Jan. 26, 1983, Ser. No. 460,978
Term of patent 14 years
U.S. Cl. D24—16

281,814
OSTEOTOMY STAPLE
Clyde R. Pratt, Somis, and Roger G. Carignan, Ventura, both of Calif., assignors to Techmedica, Inc., Camarillo, Calif.
Continuation-in-part of Ser. No. 368,653, Apr. 15, 1982, abandoned. This application Jul. 13, 1983, Ser. No. 513,381
Term of patent 14 years
U.S. Cl. D24—27

281,815
MASSAGER
Denson D. Conn, Sr., Cincinnati, Ohio, and Martin Z. Cahn, Covington, Ky., assignors to D.M. Systems, Inc., Cincinnati, Ohio
Filed Aug. 31, 1983, Ser. No. 527,974
Term of patent 14 years
U.S. Cl. D24—36

281,816
MASSAGER
Denson D. Conn, Sr., Cincinnati, Ohio, and Martin Z. Cahn, Covington, Ky., assignors to D.M. Systems, Inc., Cincinnati, Ohio
Filed Sep. 8, 1983, Ser. No. 530,378
Term of patent 14 years
U.S. Cl. D24—36

281,817
INCONTINENCE ELECTRIC STIMULATOR
Bo H. Hakanson, Lund, Sweden, and Henning Lyngberg, Kopenhamn K., Denmark, assignors to Landskrona Finans AB, Sweden
Filed Mar. 1, 1983, Ser. No. 471,060
Claims priority, application Sweden, Sep. 1, 1982, 2091/82
Term of patent 14 years
U.S. Cl. D24—41

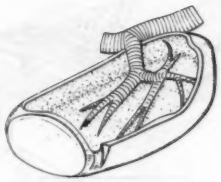


281,818
FLASHLIGHT
Donald W. Zarweile, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jan. 30, 1984, Ser. No. 574,731
Term of patent 14 years
U.S. Cl. D26—37

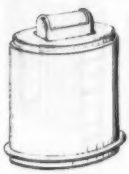
281,819
PORTABLE LIGHT
John F. Schosser, New Fairfield, Conn.; Androus D. Noyes, Ossining, N.Y., and Gerald A. Pelletier, Huntington, Conn., assignors to Duracell Inc., Bethel, Conn.
Filed Apr. 11, 1983, Ser. No. 483,971
Term of patent 14 years
U.S. Cl. D26—40

281,820
FLEXIBLE LAMP
Mikio Oba, and Kazumi Sakai, both of Tokyo, Japan, assignors to Car Mate Mfg. Co., Ltd., Tokyo, Japan
Filed Jun. 21, 1983, Ser. No. 506,343
Claims priority, application Japan, Dec. 22, 1982, 57-57068
Term of patent 14 years
U.S. Cl. D26—43

281,821
ASH TRAY
Robert J. Kirwan, P.O. Box 100, Lyme, N.H. 03768
Filed Apr. 6, 1983, Ser. No. 482,410
Term of patent 14 years
U.S. Cl. D27—22

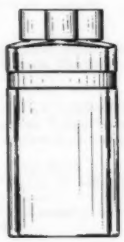


281,822
WAX DEPILATORY APPARATUS
Jean-Pierre Feldblum, Paris, France, assignor to Societe de Distribution d'Appareils pour la Coiffure (Sodac), Rungis, France
Filed Dec. 27, 1983, Ser. No. 565,881
Claims priority, application France, Jun. 27, 1983, 832396
Term of patent 14 years
U.S. Cl. D28—10

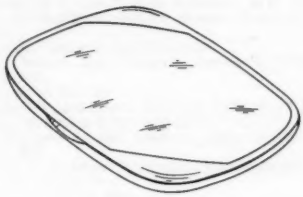


281,823
HAIR CURLING IRON
Wilfred M. Sherman, Boston, Mass., assignor to The Shetland Company, Inc., Chelsea, Mass.
Filed Aug. 4, 1983, Ser. No. 520,423
Term of patent 14 years
U.S. Cl. D28—35

281,824
COSMETIC CONTAINER
William D. Field, Chicago, Ill., assignor to Consolidated Royal Corporation, Chicago, Ill.
Filed Dec. 21, 1983, Ser. No. 563,803
Term of patent 14 years
U.S. Cl. D28—76

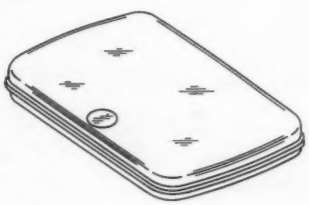


281,825
COSMETIC CASE
Dieter Bakic, Romerstr. 15, D-8000 Munchen 40, Fed. Rep. of Germany
Filed Nov. 3, 1983, Ser. No. 548,365
Claims priority, application Fed. Rep. of Germany, May 9, 1983, URA 542/83
Term of patent 14 years
U.S. Cl. D28—83



281,826
COSMETIC CASE
Dieter Bakic, Romerstr. 15, D-8000 Munchen 40, Fed. Rep. of Germany
Filed Nov. 3, 1983, Ser. No. 548,366
Claims priority, application Fed. Rep. of Germany, May 9, 1983, URA 542/83
Term of patent 14 years
U.S. Cl. D28—83

281,827
COSMETIC CASE
Dieter Bakic, Romerstr. 15, D-8000 Munchen 40, Fed. Rep. of Germany
Filed Nov. 3, 1983, Ser. No. 548,367
Claims priority, application Fed. Rep. of Germany, May 9, 1983, URA 542/83
Term of patent 14 years
U.S. Cl. D28—83



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Sundman, Frey, 4,558,477, Cl. 8-156.000.

A/S Logstrup-Steel: *See*—
Logstrup, Jorgen; and Sparre, Preben C., 4,559,413, Cl. 174-163.00R.

AB Volvo: *See*—
Sandberg, Lars; and Scheuer, Bjorn, 4,558,665, Cl. 123-25.00C.

Abar Ipsen Industries: *See*—
Moller, Craig A., 4,559,631, Cl. 373-130.000.

Abbott Laboratories: *See*—
Flentge, Charles A., 4,559,173, Cl. 260-239.00D.

Abel, Heinz; and Topfl, Rosemarie, to Ciba-Geigy Corporation. Compositions of polymers based on acrylic acid, solvents, surfactants and, if appropriate, silicone oils, their preparation and their use as anti-foams and deaerating agents. 4,559,162, Cl. 252-321.000.

Abitibi Paper Company Ltd.: *See*—
Zajic, James E.; Hill, Martha A.; Manchester, Donald F.; and Muzika, Karel, 4,559,305, Cl. 435-243.000.

Abplanalp, Robert H.; and Naku, Virgil, to Precision Valve Corporation. Method of molding an aerosol container closure. 4,559,198, Cl. 264-259.000.

Abt, Edgar J.; Van Buren, Phillip D.; and Witter, James P., to Motorola, Inc. Fast indexing encoder apparatus. 4,559,525, Cl. 340-347.00P.

Action Technology: *See*—
Gans, Leo, 4,558,889, Cl. 285-7.000.

Acushnet Company: *See*—
Brown, Robert A., 4,558,499, Cl. 29-157.30R.
Haas, Steven L.; and Gobush, William, 4,558,863, Cl. 273-77.00A.

Adams Manufacturing Company: *See*—
Sears, Lawrence M.; and Slaby, Terrance C., 4,559,594, Cl. 363-126.000.

Adamski, Joseph A., to United States of America, Air Force. Method for vacuum baking indium in-situ. 4,559,217, Cl. 423-299.000.

Advanced Micro Devices, Inc.: *See*—
Ma, Bing-Fong, 4,559,458, Cl. 307-455.000.

AEG Elotherm, GmbH: *See*—
Gosger, Peter, 4,559,435, Cl. 219-69.00D.

Agback, Karl H.; Natvig, Tore; and Truelove, Sidney C., to Pharmacia AB. Use of 3,3'-azo-bis-(6-hydroxy benzoic acid) as a drug and pharmaceutical compositions containing the same. 4,559,330, Cl. 514-166.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, 4,559,296, Cl. 430-519.000.

AGIP Petroli S.p.A.: *See*—
Quintavalle, Saverio; and Gargani, Luciano, 4,559,190, Cl. 264-45.300.

Agrawal, Anil K.; Saunders, Stephen W.; and Weckesser, George J., to Mobil Oil Corporation. Treatment of phosphate ore used in preparing phosphate matrix slurries. 4,559,204, Cl. 423-167.000.

Ahern, Anthony J. Electrostatic precipitator having spacers. 4,559,064, Cl. 55-145.000.

Ahlberg, David T., to Polysar Limited. Distillation apparatus. 4,559,108, Cl. 202-154.000.

Ahrens, Kurt H.: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.

Aida Engineering Ltd.: *See*—
Tezuka, Yoshitomo, 4,559,276, Cl. 428-599.000.

Aida, Satoshi; and Itoh, Ayao, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas introducing apparatus for respiratory gas analyzer. 4,558,709, Cl. 128-719.000.

Air Preheater Company, Inc., The: *See*—
Bellows, Kenneth O., 4,558,732, Cl. 165-8.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Okuyama, Teiji; Kuwana, Kazutaka; and Ishikawa, Masanobu, 4,558,897, Cl. 296-1.00S.

Akada, Masanori: *See*—
Kutsukake, Masaki; Yamauchi, Mineo; and Akada, Masanori, 4,559,273, Cl. 428-484.000.

Akae, Yoshifumi: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.

Akaike, Toshihiro: *See*—
Kasai, Shunji; Akaike, Toshihiro; and Miyata, Teruo, 4,559,304, Cl. 435-240.000.

Aktiebolaget SKF: *See*—
Fernlund, Ingemar, 4,558,961, Cl. 384-526.000.

Akutagawa, Tooru; and Machida, Yukihiko, to Sony Corporation. Signal translating circuit. 4,559,501, Cl. 330-293.000.

Albrecht, Raymond E.; and Lindner, Robert G., to H. H. Robertson Company. Adjustable pedestal for elevated floors. 4,558,544, Cl. 52-126.600.

Alcatel Thomson Faiscequx Hertziens: *See*—
Camand, Michel; and Chobert, Jean-Pierre, 4,559,503, Cl. 330-302.000.

Alcon Laboratories, Inc.: *See*—
Han, Wesley W.; and Roehrs, Robert E., 4,559,343, Cl. 514-264.000.

Alcudia, Empresa Para la Indusrria Quimica, S.A.: *See*—
Tapia, Graciano J.; and Martinez, Oscar G., 4,559,381, Cl. 524-405.000.

Alden, Jerome S., to Xerox Corporation. Particle dispensing system. 4,558,659, Cl. 118-653.000.

Alfa-Laval Separation AB: *See*—
Beier, Oskar H. G.; Kerf, Joseph B. J.; and Ekegren, Sven G., 4,558,574, Cl. 68-18.00R.

Alford, William L. Regular polyhedron-based logical puzzles. 4,558,866, Cl. 273-153.00S.

Allen, Frederick G.; Streit, Dwight C.; and Metzger, Robert A., to University of California, Regents of the. Method for producing hyperabrupt doping profiles in semiconductors. 4,559,091, Cl. 148-174.000.

Allied Colloids Limited: *See*—
Clarke, John B., 4,559,074, Cl. 71-24.000.

Allied Corporation: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,559,208, Cl. 422-209.000.
Lapke, James A.; and Schmelzle, Carl W., 4,559,421, Cl. 200-51.100.
Oswald, Hendrikus J.; Butler, Russell H.; and Li, Hsin L., 4,558,497, Cl. 28-257.000.
Sachs, Neville W., 4,558,599, Cl. 73-761.000.
Scardilli, A. Vincent; and Levine, Alfred L., 4,559,582, Cl. 362-23.000.
Woodruff, Frank, 4,558,770, Cl. 192-48.600.

Almgren, Per H. I.; and Durne, Christian H. P., to U.S. Philips Corporation. Illuminating arrangement in microwave ovens. 4,559,585, Cl. 362-92.000.

Alopex Industries, Inc.: *See*—
Greskovics, Paul; and Chivens, Donald R., 4,558,479, Cl. 15-1.700.

Alps Electric Co., Ltd.: *See*—
Hosogoe, Junichi, 4,559,532, Cl. 340-710.000.
Takezawa, Keiji, 4,559,515, Cl. 338-128.000.
Yamada, Toshiaki, 4,559,420, Cl. 200-6.00A.

Aluminum Company of America: *See*—
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.

ALZA Corporation: *See*—
Enscore, David J.; and Gale, Robert M., 4,559,222, Cl. 424-28.000.

Amada Company, Limited: *See*—
Sakamoto, Katsuyoshi, 4,558,616, Cl. 83-399.000.

Amano, Toshio; and Kozakai, Daisuke, to Sony Corporation. Television receiver. 4,559,561, Cl. 358-192.100.

Ambler, Frank E.: *See*—
Balser, Martin; and Ambler, Frank E., 4,558,594, Cl. 73-189.000.

Amchem Products, Inc.: *See*—
Williamson, Stanley C., 4,559,088, Cl. 148-6.15R.

American Canvas Company: *See*—
Hagler, Ernest; Roose, Charles A.; and Claypool, John B., 4,558,713, Cl. 135-106.000.

American Cyanamid Company: *See*—
Wang, David W.; and Draney, Daniel R., 4,559,400, Cl. 528-327.000.

American Electronic Laboratories, Inc.: *See*—
Markowitz, Raymond S.; Even-Or, Baruch; and Bohlman, Walter, 4,559,539, Cl. 343-725.000.

American Home Products Corporation: *See*—
Buzby, George C., Jr.; and Schouten, Henry G., 4,559,178, Cl. 260-455.00R.

American Hospital Supply Corporation: *See*—
Matier, William L., 4,559,359, Cl. 514-522.000.

American National Red Cross: *See*—
Fahy, Gregory M., 4,559,298, Cl. 435-1.000.

American Standard Inc.: *See*—
Reiss, John R.; and Katz, Richard, 4,558,907, Cl. 303-74.000.

AMF Incorporated: *See*—
Hou, Kenneth C., 4,559,145, Cl. 210-679.000.

AMP Incorporated: *See*—
Coller, James R.; and Thrush, Roger L., 4,558,912, Cl. 339-64.00M.

Kamono, Takashi; and Yamada, Hiromi, 4,558,917, Cl. 339-143.00R.

Amstutz, A. Keith; and Kinnie, Bruce H. Orthodontic shield, orthotic device and musician embouchure aid and method of producing and using same. 4,559,013, Cl. 433-22.000.

Anatros Corporation: *See*—
Danby, Hal C.; and Ritson, Carl, 4,559,045, Cl. 604-250.000.

Andersen, Steen, to Helioprint AS. Reproduction camera with system to correct exposure for stray light. 4,558,945, Cl. 355-68.000.

Anderson, Glen L.: *See*—
Littman, Erwin J.; and Anderson, Glen L., 4,558,758, Cl. 180-8.100.

Anderason, Helge: *See*—
Lagerstedt, Jan. E. R.; and Andersson, Helge, 4,559,068, Cl. 55-399.000.

Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.

Andrews, David R.: *See*—
Neustadt, Bernard R.; Andrews, David R.; and McNamara, Paul E., 4,559,340, Cl. 514-222.000.

Andrews, Gary E. Fastening device. 4,558,979, Cl. 410-101.000.

Annecke, Rudolf: *See*—
Burger, Rainer; and Annecke, Rudolf, 4,558,642, Cl. 101-148.000.

Anstalt, Interverre: *See*—
Harcuba, Siegfried, 4,559,072, Cl. 65-136.000.

ANT Nachrichtentechnik GmbH: *See*—
Grunsch, Eckhardt, 4,559,591, Cl. 363-21.000.

Anton Steinecker Maschinenfabrik GmbH: *See*—
Wolfseder, Alfons, 4,558,734, Cl. 165-113.000.

Aoki, Katsuhiko: *See*—
Betsudan, Shinichi; Aoki, Katsuhiko; Sato, Shigeru; and Katagi, Takashi, 4,559,540, Cl. 343-761.000.

Aoki, Shigetada; Usui, Masahiko; and Kitano, Kojuro, to Taiyo Fishery Co., Ltd.; and Mayekawa Mfg. Co., Ltd. Contact freezing apparatus. 4,558,572, Cl. 62-378.000.

Aotani, Seiji; and Kanayama, Hisanori, to Japan Synthetic Rubber Co., Ltd. Carrier composed of particulate polymer. 4,559,303, Cl. 435-180.000.

Applegate, Steven L.; Molloy, James J.; and Wilbur, Clayton V., to International Business Machines Corporation. Feed rates and two-mode embodiments for thermal transfer medium conservation. 4,558,963, Cl. 400-120.000.

Appliance Valves Corporation: *See*—
Donahue, William R., Jr., 4,558,844, Cl. 251-118.000.

Applied Power Inc.: *See*—
Luening, Alan R.; and Borkowski, Robert A., 4,558,849, Cl. 254-134.000.

APX Group Inc.: *See*—
Trudell, Gerald R.; Kraska, Theodore F.; and Barber, Dennis W., 4,558,721, Cl. 138-151.000.

Arai, Yoshio: *See*—
Kataoka, Hiroyuki; and Arai, Yoshio, 4,559,644, Cl. 382-9.000.

Aramaki, Jun; and Shinkai, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Wire cut electrical discharge machining apparatus with electric feeders in a tubular guide. 4,559,433, Cl. 219-69.00W.

Arano, Yasushi; Magata, Yasuhiro; and Yokoyama, Akira, to Nihon Medi-Physics Co., Ltd. P-Glyoxyloylphenylalkanoic acid bis(thiosemicarbazone) derivatives, and their production and use. 4,559,221, Cl. 424-1.100.

Arcomac S.A.: *See*—
Lehtinen, Jukka A.; Karhola, Arvo K.; and Griner, Walter H., 4,558,960, Cl. 384-373.000.

Aretz, Ulrich; Knors, Herbert; Maassen, Wilhelm; Reiners, Franz-Josef; and Tholen, Leo, to W. Schlafhorst & Co. Automatic coil winding machine. 4,558,829, Cl. 242-35.50A.

Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, to Honda Giken Kogyo Kabushiki Kaisha; and Oiles Industry Co., Ltd. Sliding member and a method for manufacturing the same. 4,559,249, Cl. 428-36.000.

Arikawa, Hiroo, to S.O.C. Corporation. Chip type fuse having connecting legs. 4,559,514, Cl. 337-201.000.

Arima, Makoto; Tsumura, Takashi; and Ueda, Akihiko, to Kurashiki Boseki Kabushiki Kaisha. Proof-printing machine. 4,558,643, Cl. 101-158.000.

Arndt, Eric D.: *See*—
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.

Arndt, Stephan: *See*—
Gehring, Fritz; Arndt, Stephan; and Storr, Harald, 4,558,722, Cl. 139-446.000.

Arnold, Fred E.: *See*—
Tsai, Tsu-Tzu; and Arnold, Fred E., 4,559,404, Cl. 548-152.000.

Arnold, Gunther: *See*—
Maier, Peter; and Arnold, Gunther, 4,558,649, Cl. 108-159.000.

Arons, Richard M., to Celanese Corporation. Production of ceramic fibers. 4,559,191, Cl. 264-60.000.

Arzouman, Harry H., to Safe-T-Jack, Inc. Mobile power unit for a jacking system. 4,558,846, Cl. 254-8.00B.

Asada, Hiroshi; Kobayashi, Kohei; and Iwama, Toshiro, to Nichikeri Chemical Industry Co. Ltd. Sludge treating method. 4,559,143, Cl. 210-714.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hatada, Koichi; Okamoto, Yoshio; and Kitayama, Tatsuki, 4,559,389, Cl. 525-250.000.

Asahi Wire Nets & Steel Ltd.: *See*—
Nakayama, Kiyoshi, 4,558,851, Cl. 256-24.000.

Asaki Kogaku Kogyo Kabushiki Kaisha: *See*—
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, 4,558,940, Cl. 354-455.000.

Asano, Ichiro: *See*—
Baba, Yasuo; and Asano, Ichiro, 4,559,492, Cl. 324-83.00D.

Asberg, Sture, to SKF Nova AB. Hub bearing unit having a ball joint. 4,558,885, Cl. 280-674.000.

Asea Aktiebolag: *See*—
Brogardh, Torgny, 4,559,643, Cl. 382-1.000.
Folgero, Kare, 4,559,632, Cl. 373-159.000.
Saha, Murari M., 4,559,491, Cl. 324-52.000.

Ash, Stephen R.; and Kaufman, Geraldine M., to Purdue Research Foundation. Permanently placed transcutaneous access device to blood vessels. 4,559,039, Cl. 604-175.000.

Ashrawi, Samir S.; and Prukop, Gabriel, to Texaco Inc. Method of extracting and reutilizing surfactants from emulsions. 4,559,148, Cl. 252-8.55D.

AT&T Bell Laboratories: *See*—
Hasegawa, Akira; and Kodama, Yuji, 4,558,921, Cl. 350-96.290.
Robinson, William V., Jr.; and Shively, Richard R., 4,559,609, Cl. 364-784.000.

AT&T Technologies, Inc.: *See*—
Bailey, Alred S.; and Fisher, John R., Jr., 4,558,812, Cl. 228-180.100.
Goulstone, Ray T.; Gursky, Michael T.; and O'Boyle, John M., 4,558,581, Cl. 72-379.000.

Atlantic Richfield Company: *See*—
Loutfy, Raouf O.; and Withers, James C., 4,559,215, Cl. 423-496.000.

Atlas Copco Aktiebolag: *See*—
Hansson, Gunnar C., 4,558,539, Cl. 51-170.00R.

Atwood, Harold T. Pizza press. 4,559,002, Cl. 425-152.000.

Auer, Werner, to Teldix GmbH. Directional gyro. 4,558,604, Cl. 74-5.440.

Aufderhaar, Ernst, to Ciba Geigy Corporation. Process for the manufacture of 5-carbamoyl-10-oxo-10,11-dihydro-5H-dibenz[b,f]azepine. 4,559,174, Cl. 260-239.00D.

Augier, Robert, to Societe Anonyme de Recherche et d'Etudes Techniques. Apparatus for manufacturing bricks of compressed earth. 4,559,004, Cl. 425-261.000.

Aussie Auto Accessory Imports, Ltd.: *See*—
Lingg, George, 4,558,633, Cl. 98-2.130.

Automobiles Citroen: *See*—
Dore, Jacques P., 4,559,025, Cl. 464-175.000.

Automobiles Peugeot: *See*—
Dore, Jacques P., 4,559,025, Cl. 464-175.000.

AVX Corporation: *See*—
Scrantom, Dehart G., 4,558,514, Cl. 29-838.000.

Awabdy, Issac A.: *See*—
Gleason, James R.; Shaffer, Roy E.; and Awabdy, Issac A., 4,559,377, Cl. 524-44.000.

Awano, Katsuya: *See*—
Irikura, Tsutomu; Suzue, Seigo; Okubo, Hideo; and Awano, Katsuya, 4,559,402, Cl. 546-121.000.

Azionaria Costruzioni Macchine Automatiche - A.C.M.A. - S.p.A.: *See*—
Rueff, Herbert; and Manfredi, Oscar, 4,558,555, Cl. 53-493.000.

Azonic Technology, Inc.: *See*—
Dunn, Joseph V., 4,559,098, Cl. 156-345.000.

B. Bunch Company, Inc.: *See*—
Bunch, Ernest B., Jr., 4,558,644, Cl. 101-226.000.

B. F. Goodrich Company, The: *See*—
Babbin, William R., 4,559,095, Cl. 156-244.130.

Baatrup, Johannes V.; and Pedersen, Harry E., to Danfoss A/S. Hydrostatic steering device steering wheel travel limits. 4,558,759, Cl. 180-132.000.

Baba, Yasuo; and Asano, Ichiro, to Horiba, Ltd. Apparatus for automatically phase-calibrating. 4,559,492, Cl. 324-83.00D.

Babbin, William R., to B. F. Goodrich Company, The. Vulcanization of hose composites protected with thermoplastic jackets. 4,559,095, Cl. 156-244.130.

Babcock & Wilcox Company, The: *See*—
Downs, William; and Rackley, John M., 4,558,652, Cl. 110-347.000.

Babrovniczky, Bert: *See*—
Minshall, Michael; Park, Brian; Etchegoyen, Carlos; and Babrovniczky, Bert, 4,558,687, Cl. 126-59.000.

Babson, Arthur L. Multiple use container for the packaging of fluids. 4,559,052, Cl. 604-403.000.

Bachmann, Rainer; and van Hauten, Hartmut, to Black & Decker Inc. Adjustable fence for a saw table or the like. 4,558,618, Cl. 83-438.000.

Bailey, Alred S.; and Fisher, John R., Jr., to AT&T Technologies, Inc. Method and apparatus for batch solder bumping of chip carriers. 4,558,812, Cl. 228-180.100.

Baker, Bernard R., to Kaiser Aluminum & Chemical Corporation. Nickel sulfate coloring process for anodized aluminum. 4,559,114, Cl. 204-37.600.

Baldwin, Bernard A.; and Mark, Harold W., to Phillips Petroleum Company. Metal working lubricant. 4,559,153, Cl. 252-48.600.

Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , to Eszakmagyarorszagi Vegyimuvek. Herbicide composition containing carboxylic-acid-amidothiolcarbamate derivatives. 4,559,083, Cl. 71-100.000.

Balser, Martin; and Ambler, Frank E., to Xontech, Inc. Phased array acoustic antenna. 4,558,594, Cl. 73-189.000.

Baltz, Richard H.: *See*—
Turner, Jan R.; Krupinski, Veronica M.; Fukuda, David S.; and Baltz, Richard H., 4,559,301, Cl. 435-76.000.

Balz, Werner: *See*—
Heil, Guenter; Spoor, Herbert; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; Balz, Werner; and Lehner, August, 4,559,118, Cl. 204-159.140.

Bannikov, Jury G.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Banno, Taiichi: *See*—
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, 4,558,946, Cl. 356-73.000.

Baranyi, Giuseppa: *See*—
Kazmaier, Peter M.; Baranyi, Giuseppa; Hsiao, Cheng-Kuo; and Burt, Richard A., 4,559,286, Cl. 430-59.000.

Barber, Dennis W.: *See*—
Trudell, Gerald R.; Kraska, Theodore F.; and Barber, Dennis W., 4,558,721, Cl. 138-151.000.

Barber, Lois M. Ulnar deviation splint. 4,558,694, Cl. 128-87.00A.

Barditch, Irving F., to United States of America, Army. Gastight seals for rubber suits. 4,558,467, Cl. 2-2.10R.

Barner, Richard; and Hubscher, Josef, to Hoffmann-La Roche Inc. Intermediate in the production of vitamin E. 4,559,407, Cl. 549-548.000.

Barnoin, Pierre: *See*—
Mens, Jacques M. N.; Barnoin, Pierre; and Martin, Michel J. L., 4,558,837, Cl. 244-108.000.

Barr, John D., to NL Industries, Inc. Drag bit and cutters. 4,558,753, Cl. 175-329.000.

Barr, Robert A. Extruder screw and positive displacement wave pump assembly. 4,558,954, Cl. 366-90.000.

Barr, Robert A. Wave pump assembly. 4,558,991, Cl. 417-199.00R.

Barreras, Francisco J.; and Martucci, James P., to Cordis Corporation. Cardiac pacer having input/output circuit programmable for use with unipolar and bipolar pacer leads. 4,558,702, Cl. 128-419.0PG.

Bartoli, Filbert: *See*—
Hoffman, Craig A.; Meyer, Jerry R.; and Bartoli, Filbert, 4,558,923, Cl. 350-354.000.

Bartolles, Rolf, to Rheinmetall GmbH. Primer cartridge magazine for a wedge-type breech block. 4,558,626, Cl. 89-24.000.

Baruffaldi Frizioni S.p.A.: *See*—
Boffelli, Pier C., 4,558,611, Cl. 74-826.000.

BASF Aktiengesellschaft: *See*—
Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, 4,559,159, Cl. 252-174.240.
Heil, Guenter; Spoor, Herbert; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; Balz, Werner; and Lehner, August, 4,559,118, Cl. 204-159.140.
Hoffmann, Gerhard, 4,559,285, Cl. 430-49.000.
Tesch, Helmut; Henne, Andreas; Heym, Manfred; and Stutz, Herbert, 4,559,398, Cl. 528-94.000.

Bashinsky, Kazimir D.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Bashour, Samuel B. Method of and apparatus for restricting the passage of food through the stomach. 4,558,699, Cl. 128-346.000.

Basnett, Robert T.; and Bratkowski, Walter V., to Westinghouse Electric Corp. Vacuum contactor having DC electromagnet with improved force watts ratio. 4,559,511, Cl. 335-132.000.

Bass, Leland J.; Quick, Roy F., Jr.; Shah, Ashwin V.; and Wickwire, Ralph O., to Burroughs Corporation. Method of electronically moving portions of several different images on a CRT screen. 4,559,533, Cl. 340-724.000.

Bastenhof, Dirk, to Ecopool Design Limited. Wave generator. 4,558,474, Cl. 4-491.000.

Bates, John K., Jr. Signal processing and synthesizing method and apparatus. 4,559,602, Cl. 364-487.000.

Battelle Development Corporation: *See*—
Haour, Georges; Richter, Dag; and Wagnieres, Willy, 4,559,187, Cl. 264-11.000.
Treharne, Richard W.; McKibben, Charlton K.; and Moles, Donald R., 4,559,206, Cl. 422-186.240.

Battelle Memorial Institute: *See*—
Rao, Surendra B., 4,559,600, Cl. 364-474.000.

Bauer, Bernhard: *See*—
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; Ludwig, Emil; Stark, Josef; Bauer, Bernhard; and Freund, Hans, 4,558,502, Cl. 29-434.000.

Bauer, Denise ; Fourre, Patrick; and Sabot, Jean-Louis, to Rhone-Poulenc Specialites Chimiques. Liquid/liquid extraction of gallium values from basic aqueous solutions thereof. 4,559,203, Cl. 423-112.000.

Bauman, Therese M.; Lee, Chi-long; and Rabe, James A., to Dow Corning Corporation. Silicone foam, water-based, aerosol composition. 4,559,369, Cl. 521-98.000.

Baumer, Klaus: *See*—
Distelrath, Heinz D.; Wiegand, Herbert; Rath, Klaus; and Baumer, Klaus, 4,559,008, Cl. 431-63.000.

Baur, Walter: *See*—
Schmitt, Reinhold; Herbert, Manfred; and Baur, Walter, 4,558,779, Cl. 198-627.000.

Baus, Heinz G. Arrangement with a fan. 4,558,526, Cl. 34-232.000.

Bausch & Lomb Incorporated: *See*—
Murr, William C., 4,558,933, Cl. 351-226.000.

Baxter Travenol Laboratories, Inc.: *See*—
Cabernoch, James L.; and White, Leonard A., 4,558,792, Cl. 215-11.00R.

Bayer Aktiengesellschaft: *See*—
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.
Noll, Klaus; Pedain, Josef; and Potter, Terry, 4,559,397, Cl. 528-45.000.
Petersen, Uwe; Grohe, Klaus; Kuhle, Engelbert; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,341, Cl. 514-254.000.
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Regel, Erik; Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,559,077, Cl. 71-76.000.
Wehinger, Egbert; Kazda, Stanislav; and Knorr, Andreas, 4,559,350, Cl. 514-332.000.

Bayerische Motoren Werke AG: *See*—
Seidl, Jiri, 4,558,676, Cl. 123-432.000.

Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung: *See*—
Nilsson, Karl E., 4,558,832, Cl. 242-107.000.

Bayes, Albert L.: *See*—
Landry, Anne D.; and Bayes, Albert L., 4,558,468, Cl. 2-51.000.

BBC Brown, Boveri & Company, Limited: *See*—
Julke, Elias; Kaiser, Tony; Osman, Maged A.; and Perkins, Roger, 4,559,167, Cl. 252-518.000.
Kirchesch, Heinz-Peter; Nurck, Wilhelm; and Widl, Wolfgang, 4,559,425, Cl. 200-146.00R.
Matt, Bernhard; Woringer, Theo; and Zouzoulas Gerassime, 4,559,275, Cl. 428-596.000.

Beach, Sidney C.; and Loar, Gary W., to McGean-Rohco, Inc. Composite puffed borax particles. 4,559,269, Cl. 428-403.000.

Beal, Clifford L.: *See*—
Kellerman, Richard J.; and Beal, Clifford L., 4,558,855, Cl. 269-158.000.

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Smith, Harry L. O., 4,558,922, Cl. 350-127.000.

Beaudoin, Paul; and Maronne, Pierre, to Societe Francaise de Services S.A. Vibrating needle viscosity meter. 4,558,588, Cl. 73-54.000.

Bebo of America: *See*—
FitzSimons, Louis N., 4,558,969, Cl. 405-124.000.

Becker, Carl; and Heizler, Fritz, to Ciba Geigy Corporation. Stable composition for treating textile substrates. 4,559,150, Cl. 252-8.600.

Becker, Hans, to Linde Aktiengesellschaft. Integrated fractional condensation system for the purification of separate crude gas streams. 4,559,069, Cl. 62-11.000.

Becker, Harold D., to Organon Teknika Corporation. Easy load peristaltic pump. 4,558,996, Cl. 417-374.000.

Beckmann, Friedrich K.; Dotsch, Horst; and Gossel, Dieter, to U.S. Philips Corporation. Ion-generator for producing an air flow. 4,559,467, Cl. 313-359.100.

Beecham Group, p.l.c.: *See*—
Hurst, Jim; and May, Josephine B., 4,559,348, Cl. 514-303.000.
King, Francis D., 4,559,346, Cl. 514-299.000.

Begluitti, John H. Quick fix drill wrench. 4,558,976, Cl. 408-226.000.

Beier, Oskar H. G.; Kerf, Joseph B. J.; and Ekegren, Sven G., to O.T.H. Beier & Company (Proprietary) Limited; and Alfa-Laval Separation AB. Wool washing and recovery of wool wax and water therefrom. 4,558,574, Cl. 68-18.00R.

Belanger, Barry F.: *See*—
Keyes, Gary S.; Belanger, Barry F.; and Hall, Anne L., 4,559,557, Cl. 358-111.000.

Belfoure, Edward L.: *See*—
Liu, Ping Y.; and Belfoure, Edward L., 4,559,388, Cl. 525-146.000.

Bell, Robert J.: *See*—
Watkins, Randy W.; Bell, Robert J.; Martorano, Joseph A.; and Essinger, Walter F., 4,559,535, Cl. 340-793.000.

Bellows, Kenneth O., to Air Preheater Company, Inc., The. Element basket for rotary regenerative heat exchangers. 4,558,732, Cl. 165-8.000.

Beloit Corporation: *See*—
Sennett, Thomas; and Guetschow, Jimmy L., 4,559,105, Cl. 162-352.000.

Benjamin, Thomas A.; and Ransom, Dean A., to Snyder Laboratories, Inc. Collapsible wound suction evacuator. 4,559,035, Cl. 604-73.000.

Bennett, Brian; and Clough, Donald K., to Sandoz Ltd. Method for improving the fastness of dyeings and optical brightenings with amine, cyanamide derivative and epihalohydrin condensate. 4,559,058, Cl. 8-496.000.

Berbalk, Hermann, to Oerlikon-Boehringer GmbH. Machine for machining crankshafts. 4,558,978, Cl. 409-200.000.

Beret, Samil: *See*—
Reynolds, John G.; Yu, S. Gary; and Beret, Samil, 4,559,130, Cl. 208-59.000.
Berg, Harvey F.; Peterson, Lyle; and Leslie, James E., to Deltec Systems, Inc. Drug delivery system. 4,559,038, Cl. 604-153.000.
Berg, Norman J.: *See*—
Casseday, Michael W.; Berg, Norman J.; and Filipov, Andree N., 4,558,925, Cl. 350-358.000.
Berger, Don E.: *See*—
Davis, Jeffrey J., 4,559,528, Cl. 340-566.000.
Berger, Zoltan, to Borbe-Wanner AG. Apparatus for shredding documents. 4,558,827, Cl. 241-224.000.
Berggren, Benny; and Gripenholt, Ninneh, to Q&Q Retreading System AB. Method for retreading vehicle tires. 4,559,093, Cl. 156-96.000.
Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material containing new azo dyes. 4,559,296, Cl. 430-519.000.
Berlekamp, Elwyn R.; and Tong, Po, to Cyclotomics, Inc. Interleavers for digital communications. 4,559,625, Cl. 371-2.000.
Berman, James. Automatic teller machine enclosure. 4,558,650, Cl. 109-24.100.
Bernard, Alain; and Dupraz, Didier. Charging process for selling information by telephone. 4,559,415, Cl. 179-2.0DP.
Bernel Chemical Company Inc.: *See*—
Fogel, Arnold W.; and Smith, Ronald J., 4,559,226, Cl. 424-66.000.
Bernhardt, Terry L., to U.S. Currency Protection Corp. Antitheft system with digitally coded signal. 4,559,529, Cl. 340-571.000.
Berry, Robert F., Jr., to United States of America, National Aeronautics and Space Administration. Ultrasonic angle beam standard reflector. 4,558,585, Cl. 73-1.0DV.
Bersier, Jacques: *See*—
Burli, Martin; Bersier, Jacques; Plattner, Eric; and Herrmann, Hans-Ulrich, 4,559,176, Cl. 260-352.000.
Berthiaume, William J. Mechanical seal. 4,558,873, Cl. 277-96.100.
Bethke, Timothy A.: *See*—
Wagner, Wayne M.; Schmeichel, Steven D.; and Bethke, Timothy A., 4,558,891, Cl. 285-322.000.
Bethlehem Steel Corporation: *See*—
Thomas, Dean G.; and Kopnicky, Robert J., 4,558,959, Cl. 374-141.000.
Betsudan, Shinichi; Aoki, Katsuhiko; Sato, Shigeru; and Katagi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Antenna system with plural horn feeds. 4,559,540, Cl. 343-761.000.
Bettschen, Josef, to Mondaine Watch Ltd. Water-tight watch. 4,558,956, Cl. 368-291.000.
Bigg, Dennis; and Menin, Jacques, to Synthelabo. 2-(Inden-2-yl)-imidazoline derivatives, process for their preparation and pharmaceutical compositions containing them. 4,559,356, Cl. 514-401.000.
Biomelktechnik Hoefelmayr & Co.: *See*—
Hoefelmayr, Tilman, 4,558,843, Cl. 251-61.000.
Bittler, Dieter: *See*—
Nickisch, Klaus; Laurent, Henry; Esperling, Peter; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,559,331, Cl. 514-173.000.
Bjerre, Poul; and Buchbjerg, Ernst, to Pasilac A/S. Process for increasing the capacity of systems for membrane filtration of milk or milk products. 4,559,231, Cl. 426-42.000.
Black & Decker Inc.: *See*—
Bachmann, Rainer; and van Hauten, Hartmut, 4,558,618, Cl. 83-438.000.
Blair, Ron B., to Mobil Oil Corporation. Mass memory system addressing circuit. 4,559,620, Cl. 367-78.000.
Blandford, Joseph W., to Seahorse Equipment Corporation. Subsea wellhead protector. 4,558,973, Cl. 405-216.000.
Blanpied, Robert H. Copolyester polyol resins, polyol blends comprising the same, and resultant polyisocyanurate foams. 4,559,370, Cl. 521-112.000.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
Raaf, Helmut, 4,559,224, Cl. 424-54.000.
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Kulesh, Vladimir P.; Moskalik, Leonid M.; Orlov, Anatoly A.; Bliznjuk, Jury A.; and Shtandel, Stanislav K., 4,558,952, Cl. 356-349.000.
Bluzer, Nathan; and Lampe, Donald R., to Westinghouse Electric Corp. Charge transfer device having an improved read-out portion. 4,559,638, Cl. 377-60.000.
Boccadoro, Yves; and Lepretre, Bernard, to Regie Nationale des Usines Renault. Process for shutoff of fuel injection during the deceleration phases of an internal combustion engine. 4,558,672, Cl. 123-325.000.
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., to Merck & Co., Inc. Soluble quinazolino-1,4-benzodiazepin-5,13-dione derivatives. 4,559,338, Cl. 514-219.000.
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., to Merck & Co., Inc. Indol-3-yl-quinazolino-1,4-benzodiazepin-5,13-diones. 4,559,339, Cl. 514-219.000.
Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Chlosta, Wolfgang; and Riegger, Wolfgang, 4,558,603, Cl. 73-864.210.
Boeder, Dieter; and Grosswendt, Werner, to Rheinmetall GmbH. Warhead. 4,558,645, Cl. 102-489.000.
Boeing Company, The: *See*—
Gants, Wilbur L.; Kline, William T.; and Sneddon, Jonathan T., 4,559,005, Cl. 425-363.000.
Norsworthy, Keith, 4,559,605, Cl. 364-726.000.
Vacanti, David C.; Read, John C.; and Takeuchi, Jimmy S., 4,559,489, Cl. 333-1.100.
Young, Fred D., 4,558,598, Cl. 73-644.000.
Boelen, Adrianus G. M., to Rolco International B.V. Device for cutting an elongate paper roll. 4,558,617, Cl. 83-425.100.
Boffelli, Pier C., to Baruffaldi Frizioni S.p.A. Angular divider device for worktables, toolholder turrets or the like. 4,558,611, Cl. 74-826.000.
Bofors Nobel, Inc.: *See*—
Schultz, Steven C., 4,559,160, Cl. 252-182.000.
Bogaty, Herman; Brown, Keith; Loveless, Norman P.; and Wolfram, Leszek J., to Clairol Incorporated. Process and composition for coloring hair with pigments. 4,559,057, Cl. 8-405.000.
Bogoditsa, Viktor P.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.
Bohlman, Walter: *See*—
Markowitz, Raymond S.; Even-Or, Baruch; and Bohlman, Walter, 4,559,539, Cl. 343-725.000.
Bohm, Georg G. A., to Firestone Tire & Rubber Company, The. Block copolymers made by radiation crosslinking of miscible mixture of homopolymers. 4,559,117, Cl. 204-159.130.
Boliden Aktiebolag: *See*—
Kullenberg, Eric N. F.; Lindahl, Gertrud M.; and Persson, Lars E. H., 4,559,220, Cl. 423-556.000.
Bolzer, Rene , to Laiterie Triballat. Installation and process for the preparation of acid caseinates. 4,559,119, Cl. 204-182.600.
Bonnamour, Michel: *See*—
Le Pargneux, Jacques; Bonnamour, Michel; and Filary, Gerard, 4,558,504, Cl. 29-452.000.
Borbe-Wanner AG.: *See*—
Berger, Zoltan, 4,558,827, Cl. 241-224.000.
Borchardt, John K.; and Young, Bill M., to Halliburton Company. Methods of minimizing fines migration in subterranean formations. 4,558,741, Cl. 166-275.000.
Borg-Warner Corporation: *See*—
Harnish, James R., 4,558,818, Cl. 236-25.00R.
Martinez, Angel C., 4,558,870, Cl. 277-15.000.
Borisenko, Alexandr G.: *See*—
Trishevsky, Igor S.; Patseka, Ivan E.; Temnikov, Eduard M.; Borisenko, Alexandr G.; Doktorov, Mark E.; Kheifets, Grigory R.; Lanko, Vladimir V.; and Miroshnichenko, Sergei V., 4,558,577, Cl. 72-12.000.
Borkowski, Robert A.: *See*—
Luening, Alan R.; and Borkowski, Robert A., 4,558,849, Cl. 254-134.000.
Bosshard, Werner, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Breechblock buffer for an automatic firing weapon. 4,558,628, Cl. 89-198.000.
Botev, Botyo P.: *See*—
Petkov, Georgi K.; Botev, Botyo P.; Naydenov, Ivan H.; Metev, Georgi M.; and Petrov, Yakim N., 4,558,579, Cl. 72-56.000.
Bothner, Carl R., to Eastman Kodak Company. Apparatus for establishing a predetermined interface between a dielectric sheet and an electrographic process station. 4,558,944, Cl. 355-3.0SH.
Boudreau, Daniel A.; Salas, Edward R.; and Sandini, James M., to Honeywell Information Systems Inc. Distributed priority network logic for allowing a low priority unit to reside in a high priority position. 4,559,595, Cl. 364-200.000.
Bouiller, Jean G.; and Soligny, Marcel R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." . Intershaft journal assembly of a multi-spool turbo-machine. 4,558,564, Cl. 60-39.161.
Bouma, James R., to Dalglish, Herbert F.; and Weitgenant, George D., part interest to each. Hitch assembly. 4,558,883, Cl. 280-478.00A.
Bowden, Paul: *See*—
Houseman, David L.; and Bowden, Paul, 4,559,618, Cl. 365-49.000.
Bowen, David R.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,559,168, Cl. 252-522.00A.
Bowen Tools, Inc.: *See*—
Peil, Archie W.; and Foreman, Arnal B., Jr., 4,558,842, Cl. 251-1.300.
Bowers, John E.: *See*—
Newton, Steven A.; and Bowers, John E., 4,558,920, Cl 350-96.150.
Boyesen, Eyvind, to Performance Industries, Inc. Motorcycle drive wheel suspension system. 4,558,761, Cl. 180-227.000.
BP Chemicals Limited: *See*—
Green, Michael J., 4,559,180, Cl. 260-463.000.
Bradley Corporation: *See*—
Fromme, Klaus J.; and Champagne, Roger D., 4,558,472, Cl. 4-252.00R.
Brandenstein, Manfred; Haas, Roland; and Hans, Rudiger, to SKF Kugelagerfabriken GmbH. Expanding wedge actuation device. 4,558,768, Cl. 188-343.000.
Brandes, Wilhelm: *See*—
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.

Bratkowski, Walter V.: *See*—
Bassett, Robert T.; and Bratkowski, Walter V., 4,559,511, Cl. 335-132.000.

Brawn, Ronald J.: *See*—
Groshong, LeRoy E.; and Brawn, Ronald J., 4,559,046, Cl. 604-282.000.

Brisou, Jean-Francois: *See*—
Despax, Damien M.; Brisou, Jean-Francois; and Castellani, Michel F., 4,558,592, Cl. 73-151.000.

Brogardh, Torgny, to Asea Aktiebolag. Opto-electronic image processor. 4,559,643, Cl. 382-1.000.

Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., to North American Philips Corporation. Metallized rare earth garnet and metal seal to same. 4,559,280, Cl. 428-633.000.

Brookes, Malcolm J.: *See*—
Mulhauser, Paul J.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kirk, Karl D., III, 4,558,810, Cl. 227-19.000.

Brophy, William R.: *See*—
Dolson, Richard G.; and Brophy, William R., 4,559,427, Cl. 200-159.00B.

Brown, Alfred: *See*—
Huang, Wann-Sheng; and Brown, Alfred, 4,558,742, Cl. 166-278.000.

Brown, Bruce; and Strickland, Wilbur C., Jr., to Procter & Gamble Company, The. Passive dosing dispenser featuring high strength initial cleaning action. 4,558,471, Cl. 4-228.000.

Brown, Carleston O. Portable minicomputer for testing memories. 4,559,626, Cl. 371-21.000.

Brown, Edward M.: *See*—
Towns, Edward J.; and Brown, Edward M., 4,558,794, Cl. 215-250.000.

Brown, Keith: *See*—
Bogaty, Herman; Brown, Keith; Loveless, Norman P.; and Wolfram, Leszek J., 4,559,057, Cl. 8-405.000.

Brown, Morton E.: *See*—
Sparks, Cecil R.; Edlund, Carl E.; and Brown, Morton E., 4,559,610, Cl. 364-803.000.

Brown, Robert A., to Acushnet Company. Method of making a mold frame. 4,558,499, Cl. 29-157.30R.

Brown University Research Foundation Inc.: *See*—
Rotman, M. Boris, 4,559,299, Cl. 435-29.000.

Bruce-Walker, Patrick, to Commonwealth of Australia Department of Defense Support, The. System for load handling of aircraft. 4,558,790, Cl. 212-77.000.

Bruck, Stephen D., to Research Corporation. Rate-controlled drug release system. 4,559,054, Cl. 604-892.000.

Bruder, John F., to Quadri Corporation. Fast, non-volatile semiconductor/bubble memory with temperature-compensated magnetic bias field. 4,559,616, Cl. 365-28.000.

Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., to Hoffmann-La Roche Inc. Substituted isoquinolines. 4,559,403, Cl. 546-144.000.

Brunner, Gerd: *See*—
Siegfried, Peter; Brunner, Gerd; and Stutzer, Dieter, 4,559,133, Cl. 208-177.000.

Brunner, Josef: *See*—
Rock, Erich; and Brunner, Josef, 4,558,908, Cl. 308-3.800.

Bruns, Engelbert: *See*—
Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, 4,559,107, Cl. 201-39.000.

Brunswick Corp.: *See*—
Neisen, Gerald F., 4,558,769, Cl. 192-3.310.

Brustle, Klaus: *See*—
Rock, Erich; and Brustle, Klaus, 4,558,485, Cl. 16-370.000.

Bruttel, Beat: *See*—
Pfenninger, Heinz; and Bruttel, Beat, 4,559,144, Cl. 210-638.000.

Buchberger, Gregory D.: *See*—
Theis, Peter F.; and Buchberger, Gregory D., 4,559,416, Cl. 179-7.10R.

Buchbjerg, Ernst: *See*—
Bjerre, Poul; and Buchbjerg, Ernst, 4,559,231, Cl. 426-42.000.

Buchel, Karl H.: *See*—
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.
Regel, Erik; Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,559,077, Cl. 71-76.000.

Bucher Guyer A.G.: *See*—
Ley, Carl, 4,558,745, Cl. 172-42.000.

Buchla, Donald F., to Kimball International, Inc. Velocity and after-touch sensitive keyboard. 4,558,623, Cl. 84-1.100.

Buddy L Corporation: *See*—
Herstein, Barry S.; and Mondini, Anthony J., 4,559,022, Cl. 446-438.000.

Buehler, Ernest: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,559,208, Cl. 422-209.000.

Buehler, Robert J.: *See*—
Friedman, Lewis; Buehler, Robert J.; Matthew, Michael W.; and Ledbetter, Myron, 4,559,096, Cl. 156-272.200.

Buffalo Color Corporation: *See*—
Grotta, Henry M., 4,559,182, Cl. 260-509.000.

Buhler, Niklaus: *See*—
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,559,237, Cl. 427-53.100.

Bujatti, Marina; and Cetronio, Antonio, to Selenia Industrie Elettroniche Associate S.p.A. Method of making a field effect transistor with modified Schottky barrier depletion region. 4,559,238, Cl. 427-82.000.

Bunch, Ernest B., Jr., to B. Bunch Company, Inc. Printing press with parallel transverse weakening line mechanism. 4,558,644, Cl. 101-226.000.

Bunke, Heinz: *See*—
Triebel, Walter; and Bunke, Heinz, 4,559,472, Cl. 313-623.000.

Burger, Rainer; and Annecke, Rudolf, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Damper for a rotary printing machine. 4,558,642, Cl. 101-148.000.

Burkhardt, Volker. Conveyer apparatus. 4,558,780, Cl. 198-780.000.

Burli, Martin; Bersier, Jacques; Plattner, Eric; and Herrmann, Hans-Ulrich, to Ciba Geigy AG. Process for the production of benzanthrone. 4,559,176, Cl. 260-352.000.

Burroughs Corporation: *See*—
Bass, Leland J.; Quick, Roy F., Jr.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,559,533, Cl. 340-724.000.
Hazel, Robert L.; and Chan, Gilbert Y., 4,559,622, Cl. 369-45.000.

Bursztejn, Jacques; and Part, Michel, to Thomson-CSF. Direct microwave demodulator of PSK signals with automatic gain control. 4,559,499, Cl. 329-50.000.

Burt, Richard A.: *See*—
Kazmaier, Peter M.; Baranyi, Giuseppa; Hsiao, Cheng-Kuo; and Burt, Richard A., 4,559,286, Cl. 430-59.000.

Burton, James A.; Elkins, Hubert L.; and Goodhart, Milton E., to Hydril Company. Method and apparatus for forming boreholes. 4,558,750, Cl. 175-61.000.

Burzynski, Stanislaw R. Purified antineoplaston fractions and methods of treating neoplastic disease. 4,559,325, Cl. 514-21.000.

Bus, Isaak; and Mooij, Joop N., to Hoogovens Groep B.V. Method and apparatus for unilateral electroplating of a moving metal strip. 4,559,113, Cl. 204-15.000.

Buss, Gary L., to CTS Corporation. Adjustable rotary switch. 4,558,513, Cl. 29-622.000.

Butler, Donald E., to Warner-Lambert Company. 5-Oxo-2-pyrrolidinepropanoic acid and derivatives for reversing electroshock amnesia. 4,559,358, Cl. 514-424.000.

Butler, Russell H.: *See*—
Oswald, Hendrikus J.; Butler, Russell H.; and L., Hsin L., 4,558,497, Cl. 28-257.000.

Buynak, William, to Chyron Corporation. Color video generator. 4,559,531, Cl. 340-703.000.

Buzby, George C., Jr.; and Schouten, Henry G., to American Home Products Corporation. Resolution of 3-benzoylthio-2-methylpropanoic acid with (+)-dehydroabietylamine. 4,559,178, Cl. 260-455.00R.

BWG-Bergwerk- und Walzwerk-Maschinenbau GmbH: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 4,558,578, Cl. 72-39.000.

Cabernoch, James L.; and White, Leonard A., to Baxter Travenol Laboratories, Inc. Container such as a nursing container, with flexible liner and access site and method of making said access site. 4,558,792, Cl. 215-11.00R.

Caddy, Stephen W.; and Holmes, Michael, to Lucas Industries public limited company. Internal combustion engine coil-type ignition control. 4,558,684, Cl. 123-609.000.

Cahen, David; and Chen, Yih W., to United States of America, Energy. Stable N-CuInSe$_2$/iodide-iodine photoelectrochemical cell. 4,559,282, Cl. 429-111.000.

California Institute of Technology: *See*—
McDermid, Iain S.; and Pacala, Thomas J., 4,559,500, Cl. 330-4.300.
Ruoff, Carl F., 4,558,911, Cl. 339-5.00M.

Call, Eugene H.; and Glover, Armond D., to Call, Eugene H. Chuck. 4,558,876, Cl. 279-1.0DA.

Camacho, David P.: *See*—
Camacho, Salvador L.; and Camacho, David P., 4,559,439, Cl. 219-121.0PM.

Camacho, Salvador L.; and Camacho, David P., to Plasma Energy Corporation. Field convertible plasma generator and its method of operation. 4,559,439, Cl. 219-121.0PM.

Camand, Michel; and Chobert, Jean-Pierre, to Alcatel Thomson Faisceaux Hertziens. Amplifier for correcting group time delay of electrical signals and an intermediate frequency amplifier stage for radio equipment comprising an amplifier of this kind. 4,559,503, Cl. 330-302.000.

Campbell, Douglas R., to Rediffusion Simulation Limited. Motion limiting systems. 4,559,014, Cl. 434-58.000.

Camus, Etienne, to Jeumont-Schneider Corporation. Total security time-delay circuit. 4,559,460, Cl. 307-592.000.

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Rubin, Leon J.; Diosady, Levente L.; Shahidi, Fereidoon; and Wood, Darrell F., 4,559,234, Cl. 426-250.000.

Candor, James T.: *See*—
Tassone, Joseph V.; and Candor, James T., 4,559,188, Cl. 264-24.000.

CanOcean Resources Ltd.: *See*—
Gibb, Peter R., 4,558,744, Cl. 166-335.000.

Canon Kabushiki Kaisha: *See*—
Hashimoto, Seiji; and Tanaka, Nobuyoshi, 4,559,559, Cl. 358-167.000.
Hirooka, Masaaki; Toma, Hitoshi; and Kondo, Hideyo, 4,559,260, Cl. 428-215.000.

Suzuki, Kenji, 4,559,446, Cl. 250-204.000.
Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 4,559,543, Cl. 346-140.00R.
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,558,965, Cl. 400-144.200.
Cantor, Harvey I.; and Nabel, Gary, to Dana Farber Cancer Institute. Assay methods and systems utilizing mast cell clones. 4,559,310, Cl. 436-519.000.
Canyon Corporation: *See*—
Tada, Tetsuya; Kawamoto, Kazuyuki; and Yamada, Akihiko, 4,558,821, Cl. 239-333.000.
Capek, Raymond G., to Zenith Electronics Corporation. Temperature compensated coaxial cable isolator. 4,559,506, Cl. 333-181.000.
Carl Freudenberg, Firma: *See*—
Passler, Michel; and Reisch, Bruno, 4,559,243, Cl. 427-209.000.
Schafer, Georg, 4,558,773, Cl. 192-106.100.
Carl, Klaus: *See*—
Welker, Thomas; Carl, Klaus; and Czarnojan, Wolfram, 4,559,469, Cl. 313-468.000.
Carl Still GmbH & Co. KG., Firma: *See*—
Lorenz, Kurt; Bruns, Engelbert; and Osterholt, Gerd, 4,559,107, Cl. 201-39.000.
Carlo Erba Strumentazione S.p.A.: *See*—
Munari, Fausto; Ostan, Giovanni; Saravalle, Carlo; Tosi, Bruno; and Trestianu, Sorin, 4,559,063, Cl. 55-67.000.
Carlsson, Stig. Loudspeaker. 4,558,762, Cl. 181-147.000.
Carlsson, Sune J. R. Apparatus for transferring pulverulent material. 4,558,724, Cl. 141-286.000.
Carpenter, Michael K.: *See*—
Ellis, Arthur B.; and Carpenter, Michael K., 4,559,116, Cl. 204-129.300.
Carter, Phillis J.: *See*—
Kemp, Gail W., 4,558,669, Cl. 123-233.000.
Casseday, Michael W.; Berg, Norman J.; and Filipov, Andree N., to United States of America, Army. Multi-function acousto-optic signal processor. 4,558,925, Cl. 350-358.000.
Castellani, Michel F.: *See*—
Despax, Damien M.; Brisou, Jean-Francois; and Castellani, Michel F., 4,558,592, Cl. 73-151.000.
Caterpillar Tractor Co.: *See*—
Mookerjee, Bhaskar, 4,558,681, Cl. 123-568.000.
Catheter Technology Corporation: *See*—
Groshong, LeRoy E.; and Brawn, Ronald J., 4,559,046, Cl. 604-282.000.
Caugant, Jean; and Stephan, Guy, to Thomson-CGR. Retractable cassette holder for a radiological and radiographic examination apparatus. 4,559,641, Cl. 378-181.000.
Caulfield, Henry J.: *See*—
Ludman, Jacques E.; Sampson, John L.; and Caulfield, Henry J., 4,558,951, Cl. 356-346.000.
Caumont, Jean-Francois, to Tempo Sanys. Apparatus for cutting discs from a sheet of flexible material. 4,558,619, Cl. 83-685.000.
Cavanna S.p.A.: *See*—
Francioni, Renzo, 4,558,777, Cl. 198-461.000.
Cavil, David T.; and Krueger, William R., to Outboard Marine Corporation. Constant voltage anode system. 4,559,017, Cl. 440-76.000.
Celanese Corporation: *See*—
Arons, Richard M., 4,559,191, Cl. 264-60.000.
Cenegy, Louis F. Method for repairing cementitious substrate. 4,559,239, Cl. 427-140.000.
Centre de Recherche Industrielle du Quebec: *See*—
Croteau, Rene, 4,559,140, Cl. 210-497.200.
Centre National de la Recherche Scientifique: *See*—
Chaussy, Jacques; Genicon, Jean-Louis; Mazuer, Jean; Pilon, Jean; and Sulpice, Andre , 4,558,512, Cl. 29-599.000.
Centrifugal Piston Expander, Inc.: *See*—
Schaich, Wilbur A., 4,558,666, Cl. 123-43.00R.
Cerberus AG: *See*—
Muggli, Jurg; and Labhart, Martin, 4,559,453, Cl. 250-565.000.
Cetrelli, Renato, to Tetra Pak International AB. Packing laminate provided with crease lines. 4,559,259, Cl. 428-167.000.
Cetronio, Antonio: *See*—
Bujatti, Marina; and Cetronio, Antonio, 4,559,238, Cl. 427-82.000.
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., to Allied Corporation. Hydrothermal crystal growing apparatus. 4,559,208, Cl. 422-209.000.
Chaly, Fedor P.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.
Champagne, Roger D.: *See*—
Fromme, Klaus J.; and Champagne, Roger D., 4,558,472, Cl. 4-252.00R.
Champion International Corporation: *See*—
Ihde, Richard C., 4,558,814, Cl. 229-17.00R.
Chan, Gilbert Y.: *See*—
Hazel, Robert L.; and Chan, Gilbert Y., 4,559,622, Cl. 369-45.000.
Chandra, Grish; Kohl, Gretchen S.; and Tassoff, James A., to Dow Corning Corporation. Conditioning shampoo containing amine functional polydiorganosiloxane. 4,559,227, Cl. 424-70.000.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Zeolite modification. 4,559,315, Cl. 502-71.000.
Chang, Kwangling; and Dave, Pankaj J., to NEI Canada Limited. Display element with back lighting. 4,558,529, Cl. 40-473.000.
Chang, Yi M.: *See*—
Fenwick, James R.; and Chang, Yi M., 4,558,597, Cl. 73-600.000.
Chappell, Anthony G., to Wellcome Australia Limited. Fluid pump. 4,558,989, Cl. 417-44.000.
Chaussy, Jacques; Genicon, Jean-Louis; Mazuer, Jean; Pilon, Jean; and Sulpice, Andre , to Centre National de la Recherche Scientifique. Process for making a connection between superconductive wires and to a connection obtained by this process. 4,558,512, Cl. 29-599.000.
Chen, Wen-Sherng; and Soucie, William G., to Kraft, Inc. Edible fibrous serum milk protein/xanthan gum complexes. 4,559,233, Cl. 426-104.000.
Chen, Yih W.: *See*—
Cahen, David; and Chen, Yih W., 4,559,282, Cl. 429-111.000.
Chersich, Claudio C.: *See*—
Wachs, Israel E.; Fiato, Rocco A.; and Chersich, Claudio C., 4,559,365, Cl. 518-717.000.
Chevron Research Company: *See*—
Goodrich, Judson E., 4,559,128, Cl. 208-22.000.
Kuehler, Christopher W., 4,559,132, Cl. 208-157.000.
Reynolds, John G.; Yu, S. Gary; and Lewis, Robert T., 4,559,129, Cl. 208-59.000.
Reynolds, John G.; Yu, S. Gary; and Beret, Samil, 4,559,130, Cl. 208-59.000.
Chiama, Bernard A., to Xerox Corporation. Very high speed duplicator with finishing function for duplex copying doing immediate inversion of copy sheets. 4,558,942, Cl. 355-14.0SH.
Childers, John S.; and Pastusek, Paul E., to Reed Rock Bit Company. Drill bit having angled nozzles. 4,558,754, Cl. 175-340.000.
Chivens, Donald R.: *See*—
Greskovics, Paul; and Chivens, Donald R., 4,558,479, Cl. 15-1.700.
Chlosta, Wolfgang; and Riegger, Wolfgang, to Bodenseewerk Perkin-Elmer & Co., GmbH. Needle assembly for introducing a carrier gas into a sample vessel. 4,558,603, Cl. 73-864.210.
Chobert, Jean-Pierre: *See*—
Camand, Michel; and Chobert, Jean-Pierre, 4,559,503, Cl. 330-302.000.
Christensen, David A.: *See*—
Van Zeeland, Anthony J.; Larson, Willis A.; and Christensen, David A., 4,559,426, Cl. 200-159.00B.
Christopherson, Herman P.: *See*—
Horner, Herbert F., Jr.; Zenner, Michael M.; Nowack, Daniel P.; and Christopherson, Herman P., 4,558,558, Cl. 56-11.300.
Chu, Zooey C.; and Dykstra, Ronald A., to Prince Corporation. Collapsible visor. 4,558,899, Cl. 296-97.00G.
Chun, Myung K., to General Electric Company. Face pumped rectangular slab laser apparatus having an improved optical resonator cavity. 4,559,627, Cl. 372-92.000.
Chung, Kwang E.: *See*—
Goldberg, Ira B.; Chung, Kwang E.; and Fadner, Thomas A., 4,559,493, Cl. 324-61.00R.
Chyron Corporation: *See*—
Buynak, William, 4,559,531, Cl. 340-703.000.
Ciba Geigy AG: *See*—
Burli, Martin; Bersier, Jacques; Plattner, Eric; and Herrmann, Hans-Ulrich, 4,559,176, Cl. 260-352.000.
Ciba-Geigy Corporation: *See*—
Abel, Heinz; and Topfl, Rosemarie, 4,559,162, Cl. 252-321.000.
Aufderhaar, Ernst, 4,559,174, Cl. 260-239.00D.
Becker, Carl; and Heizler, Fritz, 4,559,150, Cl. 252-8.600.
Fuhrer, Walter; Ostermayer, Franz; and Zimmermann, Markus, 4,559,354, Cl. 514-357.000.
Gehret, Jean-Claude; and Traber, Walter, 4,559,357, Cl. 514-423.000.
Grob, Jurgen; and Kalvoda, Jaroslav, 4,559,332, Cl. 514-175.000.
Howard, Donald K.; Finan, Michael A.; and Lees, Michael J., 4,559,214, Cl. 423-430.000.
Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, 4,559,371, Cl. 204-158.00R.
Lee, Ping I., 4,559,186, Cl. 264-2.100.
Leigh, Malcolm H.; Deiner, Hans; Philpott, George C.; Macklin, Ian S.; and McDonald, Alan, 4,559,056, Cl. 8-115.640.
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Acnim; and Topfl, Werner, 4,559,078, Cl. 71-87.000.
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,559,237, Cl. 427-53.100.
Pfenninger, Heinz; and Bruttel, Beat, 4,559,144, Cl. 210-638.000.
Spivack, John D.; and Pastor, Stephen D., 4,559,379, Cl. 524-289.000.
Storni, Angelo, 4,559,349, Cl. 514-318.000.
Su, Kai C., 4,559,059, Cl. 9-507.000.
Clairol Incorporated: *See*—
Bogaty, Herman; Brown, Keith; Loveless, Norman P.; and Wolfram, Leszek J., 4,559,057, Cl. 8-405.000.
Clarke, John B., to Allied Colloids Limited. Water absorbing polymers. 4,559,074, Cl. 71-24.000.
Claudius Peters AG: *See*—
Fischer, Alfred; Freimuth, Claus; Gerlach, Roland; and Siefert, Gerhard, 4,558,985, Cl. 415-74.000.
Clay, Howard W. Hammer with replaceable head. 4,558,726, Cl. 81-25.000.
Claypool, John B.: *See*—
Hagler, Ernest; Roose, Charles A.; and Claypool, John B., 4,558,713, Cl. 135-106.000.
Clayton Foundation for Research: *See*—
Mullani, Nizar A., 4,559,597, Cl. 364-414.000.

Clecim: *See—*
Maes, Pascal, 4,559,630, Cl. 373-93.000.
Clough, Donald K.: *See—*
Bennett, Brian; and Clough, Donald K., 4,559,058, Cl. 8-496.000.
Coates Management Pty. Ltd.: *See—*
Coates, Simon T. E., 4,558,847, Cl. 254-9.00C.
Coates, Simon T. E., to Coates Management Pty. Ltd. Patient lifting table. 4,558,847, Cl. 254-9.00C.
Cobel, George B.: *See—*
Skach, Edward J., Jr.; and Cobel, George B., 4,559,084, Cl. 75-0.50B.
"Cockerill-Sambre" : *See—*
Moore, Jean-Pierre; Winand, Rene ; Weymeersch, Alain; and Renard, Lucien, 4,559,123, Cl. 204-206.000.
Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., to Imperial Chemical Industries, PLC. Fibre reinforced compositions and methods for producing such compositions. 4,559,262, Cl. 428-294.000.
Coller, James R.; and Thrush, Roger L., to AMP Incorporated. Edge connector for chip carrier. 4,558,912, Cl. 339-64.00M.
Collins, Walter W., to Gerber Legendary Blades. Positive lock and quick release knife and sheath. 4,558,516, Cl. 30-151.000.
Collins, Walter W. Knife sharpener. 4,558,540, Cl. 51-214.000.
Color Optics, Ltd. (Partnership): *See—*
Fuhrman, Ari, 4,558,931, Cl. 351-160.00H.
Commissariat a l'Energie Atomique: *See—*
Picard, Bernard, 4,558,948, Cl. 356-124.000.
Commissarit a l'Energie Atomique: *See—*
Le Pargneux, Jacques; Bonnamour, Michel; and Filary, Gerard, 4,558,504, Cl. 29-452.000.
Commonwealth of Australia Department of Defense Support, The: *See—*
Bruce-Walker, Patrick, 4,558,790, Cl. 212-77.000.
Comp Equipment Corporation: *See—*
Votel, Thomas W., 4,559,042, Cl. 604-192.000.
Compagnie Francaise des Petroles: *See—*
Despax, Damien M.; Brisou, Jean-Francois; and Castellani, Michel F., 4,558,592, Cl. 73-151.000.
CompuSonics Corporation: *See—*
Schwartz, David M., 4,559,570, Cl. 360-77.000.
Conard, Wendall R.: *See—*
Kay, Edward L.; Gutierrez, Richard; and Conard, Wendall R., 4,559,378, Cl. 524-147.000.
Concrete Pipe & Products Corp.: *See—*
Melfi, Nicholas W., 4,558,850, Cl. 256-24.000.
Conoco Inc.: *See—*
Wasson, George E., 4,559,134, Cl. 209-166.000.
Consay, Joseph A., to Universal Skate Sharpeners Ltd. Ice skate sharpening method. 4,558,541, Cl. 51-281.00R.
Contacting-Gesellschaft fur Wirlshaftskontakte GmbH: *See—*
Rock, Siegfried; Rainer, Hans-Peter; Herzog, Reinhold; Wertitsch, Werner; Kromus, Gunter; and Kolbl, Fritz, 4,558,638, Cl. 98-88.100.
Contraves AG: *See—*
Heller, Rudolf, 4,558,857, Cl. 269-325.000.
Cooper Industries, Inc.: *See—*
Gaia, Aldino J., 4,559,513, Cl. 337-165.000.
Cordis Corporation: *See—*
Barreras, Francisco J.; and Martucci, James P., 4,558,702, Cl. 128-419.0PG.
Corning Glass Works: *See—*
Hoda, Syed N.; and Olszewski, Anthony R., 4,559,264, Cl. 428-324.000.
Cortinovis S.p.A.: *See—*
Witherden, Alan, 4,558,563, Cl. 57-266.000.
Craig Medical Products Limited: *See—*
Steer, Peter L., 4,559,048, Cl. 604-338.000.
Craighead, Norwood D., II; Prefiasco, Richard J.; and Hult, Timothy D., to United States of America, Administrator, National Aeronautics and Space Administration. Joint for deployable structures. 4,558,967, Cl. 403-113.000.
Cramer, Hans, to H. Krantz GmbH & Co. Combined pin and nipper chain. 4,558,496, Cl. 26-95.000.
Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., to Pfizer Inc. Antiinflammatory compositions and methods. 4,559,326, Cl. 514-23.000.
Creative Products Resource Associates, Ltd.: *See—*
Smith, James A.; and Reilly, James E., 4,559,157, Cl. 252-90.000.
Creusot-Loire: *See—*
Sevelinge, Gerard; and Pido, Jean-Claude, 4,558,551, Cl. 52-646.000.
Cristiani, Athos, to SASIB S.p.A. Transferring device for rod-like articles. 4,558,778, Cl. 198-471.100.
Croteau, Rene, to Centre de Recherche Industrielle du Quebec. Paint filter. 4,559,140, Cl. 210-497.200.
Crouch, William B.: *See—*
Jahnke, Frederick C.; Crouch, William B.; and Gulko, George M., 4,559,061, Cl. 48-63.000.
CTS Corporation: *See—*
Buss, Gary L., 4,558,513, Cl. 29-622.000.
Cunningham, James D. Impact devices. 4,558,747, Cl. 173-55.000.
Cunningham, William D., to Hardee's Food Systems, Inc. Openable package for a consumer product such as child's meal, with a built-in 3-D viewer feature simulating a theater. 4,558,528, Cl. 40-365.000.
Curl, Barry J., to De La Rue Systems Limited. Apparatus for determining with high resolution the position of edges of a web. 4,559,451, Cl. 250-560.000.
Cutmore, Nicholas G.: *See—*
Robinson, Vivian N. E.; and Cutmore, Nicholas G., 4,559,450, Cl. 250-310.000.
Cyclotomics, Inc.: *See—*
Berlekamp, Elwyn R.; and Tong, Po, 4,559,625, Cl. 371-2.000.
Czarnojan, Wolfram: *See—*
Welker, Thomas; Carl, Klaus; and Czarnojan, Wolfram, 4,559,469, Cl. 313-468.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kutsukake, Masaki; Yamauchi, Mineo; and Akada, Masanori, 4,559,273, Cl. 428-484.000.
Daikan Kogyo Co., Ltd.: *See—*
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,559,179, Cl. 260-456.00F.
Dalglish, Herbert F.: *See—*
Bouma, James R., 4,558,883, Cl. 280-478.00A.
Daltex Medical Sciences, Inc.: *See—*
Fox, Charles L., Jr., 4,559,223, Cl. 424-48.000.
Dana Farber Cancer Institute: *See—*
Cantor, Harvey I.; and Nabel, Gary, 4,559,310, Cl. 436-519.000.
Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Pinch valve assembly. 4,559,045, Cl. 604-250.000.
Danfoss A/S: *See—*
Baatrup, Johannes V.; and Pedersen, Harry E., 4,558,759, Cl. 180-132.000.
Dangerfield, Danny E.; and Purvis, James A., to Eli Lilly and Company. Folder for sampler perfume vial. 4,558,783, Cl. 206-472.000.
Danieli & C. Officine Meccaniche SpA: *See—*
Fedele Dell'Oste, Egidio, 4,559,629, Cl. 373-80.000.
Danielsson, Marcus; Ljunglof, Karl O.; and Hassel, Goran. Screening device having a screen deck composed of two screen frames. 4,558,787, Cl. 209-626.000.
Danziger, Menachem: *See—*
Shtrikman, Shmuel; and Danziger, Menachem, 4,558,570, Cl. 62-6.000.
Darzynkiewicz, Zbigniew: *See—*
Evenson, Donald P.; and Darzynkiewicz, Zbigniew, 4,559,309, Cl. 436-63.000.
Data Electronics, Inc.: *See—*
Olmsted, Dennis R.; and Stevens, Eric S., 4,559,571, Cl. 360-105.000.
Data General Corp.: *See—*
Houseman, David L.; and Bowden, Paul, 4,559,618, Cl. 365-49.000.
Dave, Pankaj J.: *See—*
Chang, Kwangling; and Dave, Pankaj J., 4,558,529, Cl. 40-473.000.
David, Bernard; Peltre, Gabriel; and Mecheri, Salah, to Institut Pasteur. Protein product, process for making it and pharmaceutical composition containing said protein. 4,559,230, Cl. 424-91.000.
David, Constant V. Continuous pipeline fabrication method. 4,558,971, Cl. 405-158.000.
Davidson, Christopher D., to Varian Associates, Inc. Regulated DC to DC converter. 4,559,590, Cl. 363-21.000.
Davis, Jeffrey J., to Berger, Don E., a part interest. Ornamental vibration sensor device for burglar alarm system. 4,559,528, Cl. 340-566.000.
Daw, David E.; and Vlastnik, Arthur F., to Quikduc of California, Inc. Duct assembly system. 4,558,892, Cl. 285-331.000.
Dayco Corporation: *See—*
Long, Delmar D., 4,559,261, Cl. 428-246.000.
Miranti, Joseph P., Jr.; Foley, Mark P.; Hollaway, Gerald C.; Oliver, Larry R.; Standley, Paul M.; and Lewis, James A., 4,559,029, Cl. 474-251.000.
Tassone, Joseph V.; and Candor, James T., 4,559,188, Cl. 264-24.000.
De La Rue Giori S.A.: *See—*
Kuehfuss, Runwalt, 4,558,557, Cl. 53-506.000.
Kuehfuss, Runwalt, 4,558,615, Cl. 83-74.000.
De La Rue Systems Limited: *See—*
Curl, Barry J., 4,559,451, Cl. 250-560.000.
de la Torre, Daniel M. Composition and method for the treatment of cancer. 4,559,228, Cl. 424-85.000.
Dearborn Chemicals, Ltd.: *See—*
Greaves, Brian; and Ingham, Paul, 4,559,156, Cl. 252-82.000.
Deaver, Dann T. Aerodynamic wing device and method of making same. 4,558,898, Cl. 296-1.00S.
Debarge, Philippe. Sail unit for the purpose of sport and composite device related to said unit. 4,558,655, Cl. 114-39.000.
Deedreek, Harold. Truck mirror adjustable in the horizontal direction. 4,558,930, Cl. 350-604.000.
Deiner, Hans: *See—*
Leigh, Malcolm H.; Deiner, Hans; Philpott, George C.; Macklin, Ian S.; and McDonald, Alan, 4,559,056, Cl. 8-115.640.
Delahoussaye, Ronald D.: *See—*
Kisling, Douglas L.; Hill, Edward C.; and Delahoussaye, Ronald D., 4,558,988, Cl. 416-220.00R.
Delair, Jacques: *See—*
Le Guen, Jacques; Delair, Jacques; and Plessis, Andre , 4,559,640, Cl. 378-113.000.
Delignieres, Robert, to Institut Francais du Petrole. Telemetering acoustic method for determining the relative position of a submerged object with respect to a vehicle and device therefor. 4,559,621, Cl. 367-130.000.

Deller, Nigel A.: *See*—
Francis, John H.; Deller, Nigel A.; and Perkins, Clive I., 4,558,591, Cl. 73-116.000.

Deltec Systems, Inc.: *See*—
Berg, Harvey F.; Peterson, Lyle; and Leslie, James E., 4,559,038, Cl. 604-153.000.

Demetron, Inc.: *See*—
Hunt, Charles d'A., 4,558,729, Cl. 164-122.000.

Dennis, James T., to Dennis, James T. 45 RPM Automatic play adaptor. 4,559,623, Cl. 369-207.000.

Dentifax International Inc.: *See*—
Engelman, Melvin A.; Zamaloff, Victor; and Engelman, Curtis L., 4,558,841, Cl. 249-54.000.

Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, to BASF Aktiengesellschaft. Copolymers, their preparation and their use as assistants in detergents and cleansing agents. 4,559,159, Cl. 252-174.240.

Derfler, Heinrich; Perchermeier, Jurgen; and Spitzer, Hermann, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Coating for a surface subject to exposure to a high-frequency field to prevent interference resulting from secondary electron emission. 4,559,281, Cl. 428-687.000.

Desai, Kishor V.; and Keusseyan, Roupen L., to International Business Machines Corporation. Method for measuring the real contact area in connectors. 4,558,590, Cl. 73-104.000.

Despax, Damien M.; Brisou, Jean-Francois; and Castellani, Michel F., to Compagnie Francaise des Petroles. Apparatus for on-site assessment of the effectiveness of a treatment in the course of its application to a hydrocarbon well. 4,558,592, Cl. 73-151.000.

Despres, Dominique, to Valeo. Clutch cover assembly. 4,558,771, Cl. 192-70.180.

Detterbeck, Max; and Dummler, Emil, to Siemens Aktiengesellschaft. Method and device for tying a bundle of electrical wires. 4,558,894, Cl. 289-1.500.

Deutsche Forschungs- und Versuchsanstalt fur Luft-und Raumfahrt e.v.: *See*—
Distelrath, Heinz D.; Wiegand, Herbert; Rath, Klaus; and Baumer, Klaus, 4,559,008, Cl. 431-63.000.

de Witt, Clinton J. Snap in cylinders for revolvers. 4,558,530, Cl. 42-59.000.

Deyhimy, Ira: *See*—
Stasiek, Jan S.; and Deyhimy, Ira, 4,558,601, Cl. 73-862.230.

Dick, David A.; and Staines, Glyn, to Metal Box p.l.c. Methods and apparatus for flanging tubular polymer articles. 4,559,197, Cl. 264-249.000.

Dick, Heinz, to Ford Motor Company. Air-extraction device for motor vehicles. 4,558,635, Cl. 98-2.180.

Dickie, Ray A.: *See*—
Holubka, Joseph W.; and Dickie, Ray A., 4,559,383, Cl. 524-542.000.

Diemer, Peter; and Wohner, Hans J., to Krupp Koppers GmbH. Multistage method for washing-out ammonia from gas, particularly coking oven gas. 4,559,210, Cl. 423-237.000.

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Satoh, Yuji, 4,558,498, Cl. 29-157.10R.

Diessel, Paul: *See*—
Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, 4,559,159, Cl. 252-174.240.

Dietz, Wolfgang F. W., to RCA Corporation. Raster width regulation circuit. 4,559,481, Cl. 315-411.000.

Dietzsch, Gunter: *See*—
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Diosady, Levente L.: *See*—
Rubin, Leon J.; Diosady, Levente L.; Shahidi, Fereidoon; and Wood, Darrell F., 4,559,234, Cl. 426-250.000.

Disco Abrasive Systems, Ltd.: *See*—
Ono, Takatoshi, 4,558,686, Cl. 125-13.00R.

Distelrath, Heinz D.; Wiegand, Herbert; Rath, Klaus; and Baumer, Klaus, to Deutsche Forschungs- und Versuchsanstalt fur Luft-und Raumfahrt e.v. Starting aid device for a high pressure combustion chamber. 4,559,008, Cl. 431-63.000.

Dittie, Bernhard, to Mannesmann Aktiengesellschaft. Apparatus for regulating axial compressors. 4,558,987, Cl. 415-162.000.

Divisek, Jiri; and Malinowski, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Nickel oxide based diaphragm. 4,559,124, Cl. 204-295.000.

Dockery, Denzel J., to Vortex Innerspace Products, Inc. Aquarium filtering system. 4,559,136, Cl. 210-169.000.

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Szodfridt, Imre, 4,558,607, Cl. 74-339.000.

Doenges, Michael G.: *See*—
Glantz, Jerome J.; and Doenges, Michael G., 4,559,232, Cl. 426-96.000.

Doin, James E.; and Vaughn, Howard A., Jr., to General Electric Company. Thermoformable silicone resin coating composition and dual component coating system for polycarbonate. 4,559,271, Cl. 428-412.000.

Doktorov, Mark E.: *See*—
Trishevsky, Igor S.; Patseka, Ivan E.; Temnikov, Eduard M.; Borisenko, Alexandr G.; Doktorov, Mark E.; Kheifets, Grigory R.; Lanko, Vladimir V.; and Miroshnichenko, Sergei V., 4,558,577, Cl. 72-12.000.

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Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.

Dolson, Richard G.; and Brophy, William R., to Veeder Industries, Inc. Keyboard system and module therefor. 4,559,427, Cl. 200-159.00B.

Dombay, Zsolt: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.

Domland, Christoph: *See*—
Minner, Willy; Spies, Heinz-Hermann; and Domland, Christoph, 4,558,675, Cl. 123-427.000.

Donahue, William R., Jr., to Appliance Valves Corporation. Direct acting valve assembly. 4,558,844, Cl. 251-118.000.

Donaldson Company, Inc.: *See*—
Wagner, Wayne M.; Schmeichel, Steven D.; and Bethke, Timothy A., 4,558,891, Cl. 285-322.000.

Donaldson, Timothy P.; Pirrie, Colin A.; and Maitland, Arthur, to English Electric Valve Company Limited. Metal vapor segmented discharge tubes. 4,559,466, Cl. 313-15.000.

Dooley, Thomas: *See*—
Rowe, William; Dooley, Thomas; and Shah, Ajay, 4,559,401, Cl. 544-216.000.

Dore, Jacques P., to Automobiles Citroen; and Automobiles Peugeot. Universal joint with bellows seal and vent. 4,559,025, Cl. 464-175.000.

Dorer, Casper J., Jr.; and Hayashi, Katsumi, to Lubrizol Corporation, The. Hydrocarbyl substituted carboxylic acylating agent derivative containing combinations, and fuels containing same. 4,559,155, Cl. 252-73.000.

Dotsch, Horst: *See*—
Beckmann, Friedrich K.; Dotsch, Horst; and Gossel, Dieter, 4,559,467, Cl. 313-359.100.

Doty, Gerald A., to Gateway Industries, Inc. Snubbing slip ring. 4,558,887, Cl. 280-802.000.

Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr., 4,559,399, Cl. 528-120.000.
Hurps, Richard L.; and Suh, Kyung W., 4,559,367, Cl. 521-79.000.
Roodvoets, David L., 4,559,263, Cl. 428-312.400.
Schols, John A.; and Yu, Keechung, 4,559,375, Cl. 523-449.000.
Skach, Edward J., Jr.; and Cobel, George B., 4,559,084, Cl. 75-0.50B.
Swearingen, Loren L.; Heinsohn, Alfred W.; Snook, Craig W.; Embrey, Wallace E.; and McConchie, Garnet E., 4,559,110, Cl. 203-37.000.
Wood, Clayton D.; Garrou, Philip E.; Kohatsu, Iwao; and Gleason, Edward F., 4,559,364, Cl. 518-715.000.

Dow Corning Corporation: *See*—
Bauman, Therese M.; Lee, Chi-long; and Rabe, James A., 4,559,369, Cl. 521-98.000.
Chandra, Grish; Kohl, Gretchen S.; and Tassoff, James A., 4,559,227, Cl. 424-70.000.

Dowdell, Ralph. Variably accessible band clamp. 4,558,493, Cl. 24-274.00R.

Downs, William; and Rackley, John M., to Babcock & Wilcox Company, The. Combustion of coal-water slurries. 4,558,652, Cl. 110-347.000.

Draber, Wilfried: *See*—
Regel, Erik; Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,559,077, Cl. 71-76.000.

Drake, Charles A., to Phillips Petroleum Company. Azeotropic purification of Z-11-hexadecenal. 4,559,111, Cl. 203-57.000.

Draney, Daniel R.: *See*—
Wang, David W.; and Draney, Daniel R., 4,559,400, Cl. 528-327.000.

Draper, Reed T.; and Pol, Kenneth J., to Draper, Reed T. Mechanism for converting stack access newspaper vending machines and the like to machines for dispensing products one at a time. 4,558,803, Cl. 221-229.000.

Dromsky, John A.; and Zenuk, Charles H., to Texas Instruments Incorporated. Method for making a light weight composite of pure aluminum, heat treatable aluminum, and stainless steel. 4,559,089, Cl. 148-11.50Q.

DRS Infusion Systems, Inc.: *See*—
Whitehouse, Craig M.; Snyder, Daniel R.; and Luther, Ronald B., 4,559,043, Cl. 604-201.000.

Duke, B. Michael; and Kempisty, Edward L., to Harris Graphics Corporation. Stack top control method and apparatus. 4,558,859, Cl. 271-200.000.

Dummler, Emil: *See*—
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Duncombe, Edward: *See*—
Roach, Peter F.; Duncombe, Edward; and Hulse, Ian, 4,559,436, Cl. 219-85.00M.

Dunn, Joseph V., to Azonic Technology, Inc. Nitride etch bath. 4,559,098, Cl. 156-345.000.

Dunsmoor, Forrest L., to Peachtree Doors, Inc. Window construction. 4,558,536, Cl. 49-404.000.

Du Pont de Nemours, E. I., and Company: *See*—
Kobsa, Henry; and Windley, William T., 4,559,196, Cl. 264-168.000.

Dupraz, Didier: *See—*
Bernard, Alain; and Dupraz, Didier, 4,559,415, Cl. 179-2.0DP.
Duret, Robert; and Henry, Dominique, to Thomson-CSF. Travelling wave tube comprising means for suppressing parasite oscillations. 4,559,474, Cl. 315-3.600.
Durne, Christian H. P.: *See—*
Almgren, Per H. I.; and Durne, Christian H. P., 4,559,585, Cl. 362-92.000.
Durston, David S., to Envirocor Limited. Portable air filtration device. 4,559,067, Cl. 55-324.000.
Duske, Wilfried P.; and Frank, Lowell C., to Progressive Development Incorporated. Dehydration equipment. 4,558,525, Cl. 34-128.000.
Dykstra, Ronald A.: *See—*
Chu, Zooey C.; and Dykstra, Ronald A., 4,558,899, Cl. 296-97.00G.
Dysan Corporation: *See—*
Noto, Sal J.; and Wartenbergh, Robert P., 4,559,575, Cl. 360-133.000.
E. R. Squibb & Sons, Inc.: *See—*
Zahler, Robert, 4,559,335, Cl. 514-210.000.
Eastman Kodak Company: *See—*
Bothner, Carl R., 4,558,944, Cl. 355-3.0SH.
Hawkins, Gilbert A., 4,559,086, Cl. 148-1.500.
Neumann, Stephen M.; Pearce, Glenn T.; and Sorrell, Theophilus, 4,559,291, Cl. 430-214.000.
Eaton Corporation: *See—*
Larson, Bernard J.; and Yip, James K., 4,558,720, Cl. 137-625.240.
Piber, Earl T., 4,559,016, Cl. 440-6.000.
Schutten, Herman P., 4,558,567, Cl. 60-544.000.
Ebato, Noboru: *See—*
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Echigo, Yoshiaki: *See—*
Nagai, Tadao; and Echigo, Yoshiaki, 4,559,216, Cl. 423-531.000.
Eckert, Alton B.; and Nambudiri, Easwaran C. N., to Pitney Bowes Inc. Initializing the print wheels in an electronic postage meter. 4,559,443, Cl. 235-101.000.
Ecodyne Corporation: *See—*
Frigiola, Frank J., 4,558,714, Cl. 137-2.000.
Ecopool Design Limited: *See—*
Bastenhof, Dirk, 4,558,474, Cl. 4-491.000.
Edlund, Carl E.: *See—*
Sparks, Cecil R.; Edlund, Carl E.; and Brown, Morton E., 4,559,610, Cl. 364-803.000.
Egan, William E.: *See—*
Golata, John H.; Saylor, David M.; Egan, William E.; and Goldstein, Arthur A., 4,558,727, Cl. 152-5.000.
Eguchi, Shinsuke: *See—*
Kiyoshige, Satoshi; Fujikawa, Tadashi; and Eguchi, Shinsuke, 4,558,998, Cl. 418-26.000.
Ehlers, Kenneth W.: *See—*
Leung, Ka-Ngo; Ehlers, Kenneth W.; and Hiskes, John R., 4,559,477, Cl. 315-111.810.
Eichler, Rudiger, to Erich Jaeger GmbH & Co. Testing of the airways and pulmonary tract of a patient, particularly for sensitivity to aerosols. 4,558,710, Cl. 128-720.000.
Eidson, Caswell S.: *See—*
Page, Robert K.; Villegas, Pedro; Eidson, Caswell S.; and Gaudry, Daniel, 4,559,229, Cl. 424-89.000.
Eijkelenkamp, Antonius J. H.; Held, Jan H.; and Rientjes, Gerardus J. A., to U.S. Philips Corporation. Electrolytic capacitor. 4,559,581, Cl. 361-433.000.
Eiserman, Gary K.; and Hagar, Robert W. Water trap. 4,558,696, Cl. 128-205.120.
Ekegren, Sven G.: *See—*
Beier, Oskar H. G.; Kerf, Joseph B. J.; and Ekegren, Sven G., 4,558,574, Cl. 68-18.00R.
Eldridge, Vernon F. Thumb-operated touch rod for spinning reel. 4,558,535, Cl. 43-25.000.
Electro Scientific Industries, Inc.: *See—*
Johnson, Joel C., 4,558,926, Cl. 350-373.000.
Eli Lilly and Company: *See—*
Dangerfield, Danny E.; and Purvis, James A., 4,558,783, Cl. 206-472.000.
Ingolia, Thomas D., 4,559,302, Cl. 435-172.300.
Kovacevic, Steven; Fayerman, Jeffrey T.; Miller, James R.; and Richardson, Mark A., 4,559,300, Cl. 435-68.000.
Michel, Karl H.; and Kastner, Ralph E., 4,559,323, Cl. 514-9.000.
Turner, Jan R.; Krupinski, Veronica M.; Fukuda, David S.; and Baltz, Richard H., 4,559,301, Cl. 435-76.000.
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Freshwater, John G.; and Malmquist, Alfred B., 4,559,267, Cl. 428-352.000.
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Ellis, Arthur B.; and Carpenter, Michael K., to Minnesota Mining and Manufacturing Company. Process of etching semiconductor electrodes. 4,559,116, Cl. 204-129.300.
Ellis, John: *See—*
Murphy, John M.; Spensley, Robert H.; and Ellis, John, 4,558,781, Cl. 206-219.000.
Elsner Engineering Works, Inc.: *See—*
Molison, Robert E., 4,558,802, Cl. 221-11.000.
Embrey, Wallace E.: *See—*
Swearingen, Loren L.; Heinsohn, Alfred W.; Snook, Craig W.; Embrey, Wallace E.; and McConchie, Garnet E., 4,559,110, Cl. 203-37.000.
Emelyanenko, Vadim V.: *See—*
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Endo, Isao; and Kuniya, Joji, to Toshiba Silicone Co., Ltd. Primer composition. 4,559,387, Cl. 525-102.000.
Endou, Hajime: *See—*
Hoshino, Yuji; Endou, Hajime; and Suda, Kazuyoshi, 4,558,568, Cl. 60-641.500.
Engelman, Curtis L.: *See—*
Engelman, Melvin A.; Zamaloff, Victor; and Engelman, Curtis L., 4,558,841, Cl. 249-54.000.
Engelman, Melvin A.; Zamaloff, Victor; and Engelman, Curtis L., to Dentifax International Inc. Spruing assembly. 4,558,841, Cl. 249-54.000.
Engelson, Steven N.; and McAnallan, John. Penlite and method of assembling the same. 4,559,588, Cl. 362-196.000.
Engineered Air Systems, Inc.: *See—*
Malmstrom, Herbert A.; and Roddiger, Henry A., 4,558,636, Cl. 98-39.100.
English Electric Valve Company Limited: *See—*
Donaldson, Timothy P.; Pirrie, Colin A.; and Maitland, Arthur, 4,559,466, Cl. 313-15.000.
Enscore, David J.; and Gale, Robert M., to ALZA Corporation. Matrix composition for transdermal therapeutic system. 4,559,222, Cl. 424-28.000.
Envirocor Limited: *See—*
Durston, David S., 4,559,067, Cl. 55-324.000.
Equipements Automobiles Marshall: *See—*
Gagneux, Georges C., 4,559,465, Cl. 310-242.000.
Erga, Olav, to Sintef. Process for purifying gases containing sulphur dioxide. 4,559,212, Cl. 423-243.000.
Erich Jaeger GmbH & Co.: *See—*
Eichler, Rudiger, 4,558,710, Cl. 128-720.000.
Eriksson, Erik S., to KMW Aktiebolag. Apparatus for discharging material. 4,559,104, Cl. 162-336.000.
Ernst, William R.: *See—*
Myerson, Allan S.; and Ernst, William R., 4,559,313, Cl. 502-25.000.
Erwin, Timothy R.; and Manna, Robert E., to Pitney Bowes Inc. Postage meter. 4,559,444, Cl. 235-101.000.
Eskilstuna Invest AB: *See—*
Lindner, Karl B., 4,558,545, Cl. 52-169.130.
Esperling, Peter: *See—*
Nickisch, Klaus; Laurent, Henry; Esperling, Peter; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,559,331, Cl. 514-173.000.
Essinger, Walter F.: *See—*
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ETA S.A., Fabriques d'Ebauches: *See—*
Mock, Elmar; and Muller, Jacques, 4,558,957, Cl. 368-294.000.
Etablissement Texcontor: *See—*
Maltz, Javier E., 4,559,322, Cl. 514-8.000.
Etchegoyen, Carlos: *See—*
Minshall, Michael; Park, Brian; Etchegoyen, Carlos; and Babrovniczky, Bert, 4,558,687, Cl. 126-59.000.
Evans, Archibald D.: *See—*
Franklin, Duane R.; and Evans, Archibald D., 4,558,648, Cl. 108-147.000.
Evans, Ben E.: *See—*
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,338, Cl. 514-219.000.
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,339, Cl. 514-219.000.
Evans Products Company: *See—*
Martinek, John J., 4,558,826, Cl. 241-189.00R.
Evans, Raymond J.: *See—*
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Even-Or, Baruch: *See—*
Markowitz, Raymond S.; Even-Or, Baruch; and Bohlman, Walter, 4,559,539, Cl. 343-725.000.
Evenson, Donald P.; and Darzynkiewicz, Zbigniew, to Memorial Sloan Kettering Cancer Center. Flow cytometry-fluorescence measurements for characterizing sperm. 4,559,309, Cl. 436-63.000.
Exxon Production Research Co.: *See—*
Huffaker, Roger W., 4,558,751, Cl. 175-99.000.
Exxon Research and Engineering Co.: *See—*
Wachs, Israel E.; Fiato, Rocco A.; and Chersich, Claudio C., 4,559,365, Cl. 518-717.000.
Fab-Form Products, Inc.: *See—*
Rutter, Thomas M., 4,558,848, Cl. 254-100.000.

Fabrig, Paul, to Womako Maschinenkonstruktionen GmbH. Method and apparatus for assembling pronged binding strips with stacks of paper sheets or the like. 4,558,981, Cl. 412-7.000.

Facit Aktiebolag: *See—*
Rozsa, Kalman, 4,559,448, Cl. 250-231.0SE.

Fadner, Thomas A.: *See—*
Goldberg, Ira B.; Chung, Kwang E.; and Fadner, Thomas A., 4,559,493, Cl. 324-61.00R.

Fagerstedt, Nils U. H.: *See—*
Roos, Sture G.; Fagerstedt, Nils U. H.; and Pehrson, Jens E., 4,559,624, Cl. 370-56.000.

Fahy, Gregory M., to American National Red Cross. Cryopreservation of biological materials in a non-frozen or vitreous state. 4,559,298, Cl. 435-1.000.

Faltys, Jan, to Sulzer-Escher Wyss AG. Control mechanism for the stator vanes of an axial turbine device. 4,558,986, Cl. 415-150.000.

Fanuc Ltd.: *See—*
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,559,601, Cl. 364-475.000.

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Kinoshita, Mitsuo, 4,559,434, Cl. 219-69.00M.

Farnworth, David J. Handle. 4,558,896, Cl. 294-156.000.

Farrugia, Anthony. Ranged voltage monitor with out-of-range enunciators. 4,559,497, Cl. 324-133.000.

Fassbender, Rolf, to Zahnradfabrik Friedrichshafen, AG. Control system for two hydraulic power cylinders supplied by a pressure pump via one branch connection each. 4,558,631, Cl. 91-516.000.

Fayerman, Jeffrey T.: *See—*
Kovacevic, Steven; Fayerman, Jeffrey T.; Miller, James R.; and Richardson, Mark A., 4,559,300, Cl. 435-68.000.

Fedele Dell'Oste, Egidio, to Danieli & C. Officine Meccaniche SpA. Procedure and means for preheating scrap to be charged into a smelting furnace. 4,559,629, Cl. 373-80.000.

Feldman, Paul L.; and Gleason, Robert J., to Research-Cottrell, Inc. Method for reduced temperature operation of flue gas collectors. 4,559,211, Cl. 423-242.000.

Felesky, Arthur. Method and means of testing and refining bicycle riding skills. 4,559,015, Cl. 434-61.000.

Felix, Raymond A.; and Hsu, Joanna K., to Stauffer Chemical Co. Herbicide compositions of extended soil life. 4,559,082, Cl. 71-98.000.

Fencl, Vernon R., to Grotnes Metalforming Systems, Inc. Automotive rim roll forming drive system. 4,559,482, Cl. 318-50.000.

Fendley, James R.; Kraner, James L.; and Pekosh, Raymond J., to Zenith Electronics Corporation. Automatic gun mount alignment apparatus. 4,559,019, Cl. 445-67.000.

Fenwick, James R.; and Chang, Yi M., to United States of America, Air Force. Surface tension screen failure detection method and apparatus. 4,558,597, Cl. 73-600.000.

Fernlund, Ingemar, to Aktiebolaget SKF. Cage for a rolling bearing. 4,558,961, Cl. 384-526.000.

Fetter, Jozsef: *See—*
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.

F'Geppert, Erwin, to United States of America, Army. Variable speed drive. 4,558,606, Cl. 74-193.000.

Fiato, Rocco A.: *See—*
Wachs, Israel E.; Fiato, Rocco A.; and Chersich, Claudio C., 4,559,365, Cl. 518-717.000.

Figgie International Inc.: *See—*
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,558,470, Cl. 2-414.000.

Filary, Gerard: *See—*
Le Pargneux, Jacques; Bonnamour, Michel; and Filary, Gerard, 4,558,504, Cl. 29-452.000.

Filatov, Nikolai I.: *See—*
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.

Filipov, Andree N.: *See—*
Casseday, Michael W.; Berg, Norman J.; and Filipov, Andree N., 4,558,925, Cl. 350-358.000.

Finan, Michael A.: *See—*
Howard, Donald K.; Finan, Michael A.; and Lees, Michael J., 4,559,214, Cl. 423-430.000.

Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A., 4,559,117, Cl. 204-159.130.
Kay, Edward L.; Gutierrez, Richard; and Conard, Wendall R., 4,559,378, Cl. 524-147.000.

Fischer, Alfred; Freimuth, Claus; Gerlach, Roland; and Siefert, Gerhard, to Claudius Peters AG. Pump with screw conveyors on each end. 4,558,985, Cl. 415-74.000.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Multi-sheet rotary folding apparatus, particularly for association with rotary printing machines. 4,559,032, Cl. 493-432.000.

Fisher, John R., Jr.: *See—*
Bailey, Alred S.; and Fisher, John R., Jr., 4,558,812, Cl. 228-180.100.

FitzSimons, Louis N., to Bebo of America. Hinge for use with large pre-cast overfilled load support structures. 4,558,969, Cl. 405-124.000.

Flachglas Aktiengesellschaft: *See—*
Wiedenhofer, Heinrich; and Szabo, Tibor, 4,559,001, Cl. 425-114.000.

Flemmert, Gosta. Process and apparatus for preparing finely-divided silicon dioxide having good thixotropic properties. 4,559,218, Cl. 423-336.000.

Flentge, Charles A., to Abbott Laboratories. N-substituted dibenz[b,f]azepine salts. 4,559,173, Cl. 260-239.00D.

Flynn, John J.: *See—*
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,559,208, Cl. 422-209.000.

Fogel, Arnold W.; and Smith, Ronald J., to Bernel Chemical Company Inc.; and Heterene Chemical Company, Inc. Self-emulsifying alkoxylate esters. 4,559,226, Cl. 424-66.000.

Folco, Luciano; and Reniero, Cirillo S., to Folco, Luciano. Continuous-cycle electroplating plant. 4,559,122, Cl. 204-201.000.

Foley, Mark P.: *See—*
Miranti, Joseph P., Jr.; Foley, Mark P.; Hollaway, Gerald C.; Oliver, Larry R.; Standley, Paul M.; and Lewis, James A., 4,559,029, Cl. 474-251.000.

Folgero, Kare, to Asea Aktiebolag. Channel-type induction furnace of the teapot type. 4,559,632, Cl. 373-159.000.

Ford Aerospace & Communications Corporation: *See—*
Westerman, Charles W., 4,559,541, Cl. 343-792.500.

Ford Motor Company: *See—*
Dick, Heinz, 4,558,635, Cl. 98-2.180.
Holubka, Joseph W.; and Dickie, Ray A., 4,559,383, Cl. 524-542.000.
Holubka, Joseph W., 4,559,393, Cl. 525-531.000.
Kloppe, Herbert; Spiegel, Erwin; and Vogt, Hans, 4,559,274, Cl. 428-594.000.

Forde, George S., Jr. Self-wiping universal liquid level gauge. 4,558,520, Cl. 33-126.70R.

Foreman, Arnal B., Jr.: *See—*
Peil, Archie W.; and Foreman, Arnal B., Jr., 4,558,842, Cl. 251-1.300.

Foreman, John W., Jr.: *See—*
Horton, Gilbert L.; Poole, Eddie D.; and Foreman, John W., Jr., 4,558,653, Cl. 112-262.200.

Forneris, Alexandre, to Hutchinson S.A. Tire mounting device utilizing a locking sleeve. 4,558,728, Cl. 152-400.000.

Fourman, Robert G. Sunscreen composition. 4,559,225, Cl. 424-59.000.

Fourre, Patrick: *See—*
Bauer, Denise ; Fourre, Patrick; and Sabot, Jean-Louis, 4,559,203, Cl. 423-112.000.

Fox, Charles L., Jr., to Daltex Medical Sciences, Inc. Silver sulfadiazine and/or zinc sulfadiazine-containing toothpaste or oral medicament. 4,559,223, Cl. 424-48.000.

Framatome & Cie: *See—*
Le Pargneux, Jacques; Bonnamour, Michel; and Filary, Gerard, 4,558,504, Cl. 29-452.000.

Francioni, Renzo, to Cavanna S.p.A. Device for transferring biscuits and confectionery products in general. 4,558,777, Cl. 198-461.000.

Francis, John H.; Deller, Nigel A.; and Perkins, Clive I., to Lucas Industries public limited company. Engine position transducer means. 4,558,591, Cl. 73-116.000.

Franetzki, Manfred; Gagneur, Klaus; and Prestele, Karl, to Siemens Aktiengesellschaft. Device for the pre-programmable infusion of liquids. 4,559,037, Cl. 604-151.000.

Frank, Lowell C.: *See—*
Duske, Wilfried P.; and Frank, Lowell C., 4,558,525, Cl. 34-128.000.

Franklin, Duane R.; and Evans, Archibald D., to Lift-R Technologies, Inc. Energy-recycling scissors lift. 4,558,648, Cl. 108-147.000.

Franz, Herbert, to Heinrich Kopp GmbH & Co. KG. Equipment protecting electrical circuit breaker. 4,559,510, Cl. 335-13.000.

Frauenrath, Herbert: *See—*
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.

Freedom Industries, Inc.: *See—*
Schott, Roger A.; and Schott, Lawrence A., 4,559,516, Cl. 340-73.000.

Freeman, Gary T.; Maxner, Richard B.; and Nash, Thomas F., to USM Corporation. Automatic board handling mechanism. 4,558,983, Cl. 414-331.000.

Freepons, Donald E., to Melamine Chemicals, Inc. Fertilizer processes and compositions using s-triazines. 4,559,075, Cl. 71-28.000.

Freidinger, Roger M.: *See—*
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,338, Cl. 514-219.000.
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,339, Cl. 514-219.000.

Freimuth, Claus: *See—*
Fischer, Alfred; Freimuth, Claus; Gerlach, Roland; and Siefert, Gerhard, 4,558,985, Cl. 415-74.000.

Freshwater, John G.; and Malmquist, Alfred B., to Elk Corporation. Stick-down system for roofing. 4,559,267, Cl. 428-352.000.

Freund, Hans: *See—*
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; Ludwig, Emil; Stark, Josef; Bauer, Bernhard; and Freund, Hans, 4,558,502, Cl. 29-434.000.

Freund, Hans-Ulrich; Heide, Wolfgang M.; and Sieglen, Rolf A., to Luossavaara Kiirunavaara AB. Device for obtaining dust from minerals. 4,558,752, Cl. 175-207.000.

Freyssinet International (STUP) S.A.: *See—*
Nieto, Jean-Francois A., 4,558,547, Cl. 52-223.00L.

Friedman, Lewis; Buehler, Robert J.; Matthew, Michael W.; and Ledbetter, Myron, to United States of America, Energy. Method of

precisely modifying predetermined surface layers of a workpiece by cluster ion impact therewith. 4,559,096, Cl. 156-272.200.
Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Kiendl, Harro, 4,558,817, Cl. 236-12.120.
Frigiola, Frank J., to Ecodyne Corporation. Resin interface detection system. 4,558,714, Cl. 137-2.000.
Froeschke, Reinhard, to Santrade Ltd. Apparatus for the production of granulates. 4,559,000, Cl. 425-6.000.
Frohberger, Paul-Ernst: *See*—
Regel, Erik; Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Lurssen, Klaus, 4,559,077, Cl. 71-76.000.
Fromme, Klaus J.; and Champagne, Roger D., to Bradley Corporation. Adjustable wall sleeve. 4,558,472, Cl. 4-252.00R.
Fruzzetti, Paul R., to Varian Associates, Inc. Ball-type vacuum valve for leak detection apparatus. 4,558,587, Cl. 73-40.700.
Frye, John G., Jr.: *See*—
Mazanec, Terry J.; and Frye, John G., Jr., 4,559,316, Cl. 502-73.000.
Fuerstenwerth, Hauke: *See*—
Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, 4,559,296, Cl. 430-519.000.
Fuhrer, Walter; Ostermayer, Franz; and Zimmermann, Markus, to Ciba-Geigy Corporation. Certain antihypertensive 1-[2-[3-carbamoyl-4-hydroxy phenoxy]alkylene amino]-heterocyclic phenoxypropanol derivatives. 4,559,354, Cl. 514-357.000.
Fuhrman, Ari, to Color Optics, Ltd. (Partnership). Colored soft contact lens. 4,558,931, Cl. 351-160.00H.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Hara, Kazuo, 4,558,677, Cl. 123-440.000.
Nakazato, Kazuo, 4,558,680, Cl. 123-559.000.
Fuji Photo Film Co., Ltd.: *See*—
Mitsuo, Hirofumi; Watanabe, Shojiro; and Saeki, Keiso, 4,559,242, Cl. 427-150.000.
Nakao, Sho; Kunichika, Kenji; Ohishi, Chikashi; Iwai, Masato; and Iwamoto, Kiyoshi, 4,559,288, Cl. 430-60.000.
Sawada, Satoru; Fujita, Shinsaku; and Koyama, Koichi, 4,559,290, Cl. 430-203.000.
Seto, Nobuo; Furutachi, Nobuo; Morigaki, Masakazu; and Nakazyo, Kiyoshi, 4,559,297, Cl. 430-551.000.
Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Kido, Keishiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,559,289, Cl. 430-66.000.
Fuji Xerox Co., Ltd.: *See*—
Kataoka, Hiroyuki; and Arai, Yoshio, 4,559,644, Cl. 382-9.000.
Mita, Tsunemasa, 4,559,542, Cl. 346-76.0PH.
Fujii, Hiroshi: *See*—
Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, 4,559,423, Cl. 200-144.00R.
Fujii, Masaharu: *See*—
Nakashima, Hiroyuki; Tamura, Atuyoshi; Kanbara, Yoichi; and Fujii, Masaharu, 4,559,268, Cl. 428-397.000.
Fujii, Masahiko: *See*—
Nomura, Akihiko; and Fujii, Masahiko, 4,559,384, Cl. 524-612.000.
Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.
Fujikawa, Atsunobu: *See*—
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Fujikawa, Tadashi: *See*—
Kiyoshige, Satoshi; Fujikawa, Tadashi; and Eguchi, Shinsuke, 4,558,998, Cl. 418-26.000.
Fujikura Ltd.: *See*—
Goto, Moritaka; and Kameoka, Takahito, 4,558,913, Cl. 339-74.00R.
Fujimoto, Tetsuo: *See*—
Kurita, Akitsugu; and Fujimoto, Tetsuo, 4,559,319, Cl. 502-156.000.
Fujimura, Takashi: *See*—
Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, 4,559,452, Cl. 250-560.000.
Fujino, Masahiko; and Kitada, Chieko, to Takeda Chemical Industries, Ltd. Polypeptide-diesters, their production and use. 4,559,324, Cl. 514-14.000.
Fujisaki, Tadashi: *See*—
Minato, Hideo; Fujisaki, Tadashi; Shimizu, Kazufusa; and Koyanagi, Yoshiharu, 4,559,073, Cl. 71-9.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,559,334, Cl. 514-202.000.
Fujita, Kazunori: *See*—
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Fujita, Shinsaku: *See*—
Sawada, Satoru; Fujita, Shinsaku; and Koyama, Koichi, 4,559,290, Cl. 430-203.000.
Fujita, Yasumasa: *See*—
Inagaki, Takashi; Fujita, Yasumasa; and Izawa, Shinichiro, 4,558,667, Cl. 123-90.440.
Fujitsu Limited: *See*—
Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, 4,559,452, Cl. 250-560.000.
Ohnishi, Katsumi, 4,559,596, Cl. 364-200.000.
Fujiwara, Hideo: *See*—
Kumasaka, Noriyuki; Fujiwara, Hideo; Otomo, Shigekazu; Yamashita, Takeo; Takayama, Shinji; Saito, Noritoshi; Kobayashi, Nobuo; and Kudo, Mitsuhiro, 4,559,572, Cl. 360-110.000.
Fukami, Akira: *See*—
Oshiro, Takao; Fukami, Akira; and Sasaya, Hideaki, 4,558,634, Cl. 98-2.180.
Fukuchi, Hiroshi: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,558,612, Cl. 74-844.000.
Fukuda, David S.: *See*—
Turner, Jan R.; Krupinski, Veronica M.; Fukuda, David S.; and Baltz, Richard H., 4,559,301, Cl. 435-76.000.
Fulkerson, Larry R., to Norton Christensen, Inc. Anti-jamming core barrels. 4,558,749, Cl. 175-58.000.
Fuller, Robert P.; and Nordstrom, Larry A., to U-Lite, Inc. Fluorescent lamp circuit. 4,559,478, Cl. 315-224.000.
Fullmer, Paul H. Chain saw carrying backpack. 4,558,808, Cl. 224-270.000.
Furuhashi, Michio: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Furukawa, Tatsuya; and Horike, Masanori, to Ricoh Company, Ltd. Pump for supplying head of ink jet printer with ink under pressure. 4,558,995, Cl. 417-322.000.
Furukawa, Yoshimi; Sano, Shoichi; and Takamatsu, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for vehicles. 4,558,877, Cl. 280-91.000.
Furuta, Toshio: *See*—
Takamiya, Shigeo; and Furuta, Toshio, 4,558,906, Cl. 299-31.000.
Furutachi, Nobuo: *See*—
Seto, Nobuo; Furutachi, Nobuo; Morigaki, Masakazu; and Nakazyo, Kiyoshi, 4,559,297, Cl. 430-551.000.
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M. Seeder cart attachment to agricultural implements. 4,558,882, Cl. 280-476.00A.
Fuss, Eric W.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,558,882, Cl. 280-476.00A.
Fuss, Jarvis R.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,558,882, Cl. 280-476.00A.
Fuss, Roy M.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,558,882, Cl. 280-476.00A.
Futagawa, Tosinobu. Apparatus for driving tapes. 4,558,831, Cl. 242-55.000.
G.D. Searle & Co.: *See*—
Mueller, Richard A., 4,559,336, Cl. 514-211.000.
Mueller, Richard A., 4,559,337, Cl. 514-211.000.
Gagneur, Klaus: *See*—
Franetzki, Manfred; Gagneur, Klaus; and Prestele, Karl, 4,559,037, Cl. 604-151.000.
Gagneux, Georges C., to Equipements Automobiles Marshall. Brush holder assembly for an electric motor. 4,559,465, Cl. 310-242.000.
Gaia, Aldino J., to Cooper Industries, Inc. Trigger mechanism for dual-element fuse. 4,559,513, Cl. 337-165.000.
Gale, Robert M.: *See*—
Enscore, David J.; and Gale, Robert M., 4,559,222, Cl. 424-28.000.
Gall, John C., to Sears, Roebuck & Co. Drive system for exercise apparatus or the like. 4,558,861, Cl. 272-73.000.
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, to Olympus Optical Co. Ltd. Automatic analyzing apparatus. 4,558,946, Cl. 356-73.000.
Gambell, John A.: *See*—
Iverson, Peter B.; and Gambell, John A., 4,558,782, Cl. 206-387.000.
Ganguly, Ashit K.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; and Patel, Naginbhai M., 4,559,333, Cl. 514-192.000.
Gannon, Mark A.; and Yester, Francis R., Jr., to Motorola, Inc. Method for maintaining constant bandwidth over a frequency spectrum in a dielectric resonator filter. 4,559,490, Cl. 333-202.000.
Gans, Leo, to Action Technology. Aquatic vacuum hose swivel cuff. 4,558,889, Cl. 285-7.000.
Gants, Wilbur L.; Kline, William T.; and Sneddon, Jonathan T., to Boeing Company, The. Machine for forming composite material into fillets. 4,559,005, Cl. 425-363.000.
Garfield, James R. Forced air ducting flow control valve. 4,558,718, Cl. 137-614.110.
Gargani, Luciano: *See*—
Quintavalle, Saverio; and Gargani, Luciano, 4,559,190, Cl. 264-45.300.
Garrett, Charles B., to Varian Associates, Inc. Wafer lifting and holding apparatus. 4,558,984, Cl. 414-609.000.
Garrou, Philip E.: *See*—
Wood, Clayton D.; Garrou, Philip E.; Kohatsu, Iwao; and Gleason, Edward F., 4,559,364, Cl. 518-715.000.
Gateway Industries, Inc.: *See*—
Doty, Gerald A., 4,558,887, Cl. 280-802.000.
Gaudry, Daniel: *See*—
Page, Robert K.; Villegas, Pedro; Eidson, Caswell S.; and Gaudry, Daniel, 4,559,229, Cl. 424-89.000.
Gay, Richard L.; and Grantham, LeRoy F., to Rockwell International Corporation. Disposal of bead ion exchange resin wastes. 4,559,170, Cl. 252-628.000.

Gebruder Netzsch Maschinenfabrik GmbH & Co.: *See*—
John, Willy; Klimaschka, Norbert; Wagner, Arno; and Meyer, Gunther, 4,558,825, Cl. 241-171.000.
Gehret, Jean-Claude; and Traber, Walter, to Ciba-Geigy Corporation. Insecticidal and acaricidal phenylhydrazono- and phenylhydrazino-pyrrolidines. 4,559,357, Cl. 514-423.000.
Gehring, Fritz; Arndt, Stephan; and Storr, Harald, to Lindauer Dornier Gesellschaft mbH. Apparatus for the constrained actuation of the clamping system of filling yarn inserting members in shuttleless weaving machines. 4,558,722, Cl. 139-446.000.
Geissler, Ulrich; Herwig, Walter; and Sikora, Helga, to Hoechst Aktiengesellschaft. Photosensitive transfer material having a support of defined roughness. 4,559,292, Cl. 430-256.000.
General Dynamics Pomona Division: *See*—
Shores, Marvin W., 4,558,918, Cl. 339-143.00R.
General Electric Company: *See*—
Chun, Myung K., 4,559,627, Cl. 372-92.000.
Doin, James E.; and Vaughn, Howard A., Jr., 4,559,271, Cl. 428-412.000.
Glover, Gary H.; and Kerwin, Edward M., 4,559,639, Cl. 378-19.000.
Hale, Alan A., 4,558,975, Cl. 408-186.000.
Harnden, John D., Jr.; and Kornrumpf, William P., 4,559,496, Cl. 324-127.000.
Herrick, Carlyle S., 4,559,219, Cl. 423-350.000.
Keyes, Gary S.; Belanger, Barry F.; and Hall, Anne L., 4,559,557, Cl. 358-111.000.
Kostelnik, Robert J.; and Wambach, Allen D., 4,559,164, Cl. 252-511.000.
Liu, Ping Y.; and Belfoure, Edward L., 4,559,388, Cl. 525-146.000.
McVey, Charles I., 4,559,473, Cl. 313-630.000.
Stokes, Vijay K., 4,559,464, Cl. 310-233.000.
Wilson, Arthur C., 4,558,503, Cl. 29-446.000.
General Electric Company, p.l.c., The: *See*—
Roberts, Derek H.; and Pepper, Michael, 4,559,549, Cl. 357-24.000.
General Motors Corporation: *See*—
Grimes, Michael R.; and Vukovich, William J., 4,558,772, Cl. 192-0.076.
Hood, Paul F., 4,559,205, Cl. 422-180.000.
LeBlanc, James C.; and LeBlanc, Richard S., 4,558,627, Cl. 89-41.030.
General Signal Corporation: *See*—
Tanner, Douglas J., 4,558,605, Cl. 74-102.000.
Genicon, Jean-Louis: *See*—
Chaussy, Jacques; Genicon, Jean-Louis; Mazuer, Jean; Pilon, Jean; and Sulpice, Andre , 4,558,512, Cl. 29-599.000.
Georgia Tech Research Institute: *See*—
Myerson, Allan S.; and Ernst, William R., 4,559,313, Cl. 502-25.000.
Gepipari Technologiai Intezet: *See*—
Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, 4,558,748, Cl. 175-57.000.
Gerber Legendary Blades: *See*—
Collins, Walter W., 4,558,516, Cl. 30-151.000.
Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, to Gepipari Technologiai Intezet; and Szenbanyak, Mecseki. Method and equipment for boring and casing air vent holes and/or delivery holes in medium-steep and steep dip coal deposits and rocks of loose structure. 4,558,748, Cl. 175-57.000.
Gerlach, Roland: *See*—
Fischer, Alfred; Freimuth, Claus; Gerlach, Roland; and Siefert, Gerhard, 4,558,985, Cl. 415-74.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Unger, Eberhart; and Heitkamp, Herbert, 4,558,629, Cl. 91-29.000.
Gibb, Peter R., to CanOcean Resources Ltd. Subsea caisson and method of installing same. 4,558,744, Cl. 166-335.000.
Giebel, Gerhard, to USM Corporation. Device for tensioning a shoe upper on a last and for laying its lasting margin over in the ball and shank region. 4,558,478, Cl. 12-81.000.
Giolito, Silvio L.; and Mirviss, Stanley B., to Stauffer Chemical Company. Phosphate ester synthesis without phosphorylation catalyst. 4,559,184, Cl. 260-974.000.
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; and Patel, Naginbhai M., to Schering Corporation. Hydrazone substituted penems. 4,559,333, Cl. 514-192.000.
Giroud-Abel, Bruno, to Rhone-Poulenc Specialities Chimiques. Fireproofed polyamide compositions. 4,559,372, Cl. 523-205.000.
Givens, Edwin N.: *See*—
Ying, David H. S.; McDermott, Wayne T.; and Givens, Edwin N., 4,558,651, Cl. 110-347.000.
Glantz, Jerome J.; and Doenges, Michael G., to Lamb-Weston, Inc. Process for making particle embedded food products. 4,559,232, Cl. 426-96.000.
Gleason, Edward F.: *See*—
Wood, Clayton D.; Garrou, Philip E.; Kohatsu, Iwao; and Gleason, Edward F., 4,559,364, Cl. 518-715.000.
Gleason, James R.; Shaffer, Roy E.; and Awabdy, Issac A., to Owens-Corning Fiberglas Corporation. Ceiling board edge coating. 4,559,377, Cl. 524-44.000.
Gleason, Robert J.: *See*—
Feldman, Paul L.; and Gleason, Robert J., 4,559,211, Cl. 423-242.000.
Gleichauf, Paul H., deceased: *See*—
Morrison, Raymond C.; Gleichauf, Paul H., deceased; and Gleichauf, Theresa C., executrix, 4,559,468, Cl. 313-456.000.
Gleichauf, Theresa C., executrix: *See*—
Morrison, Raymond C.; Gleichauf, Paul H., deceased; and Gleichauf, Theresa C., executrix, 4,559,468, Cl. 313-456.000.
Glennon, Timothy F., to Sundstrand Corporation. Method and apparatus for reducing the number of switching transitions in a voltage source inverter. 4,559,593, Cl. 363-41.000.
Glory Kogyo Kabushiki Kaisha: *See*—
Ikuta Yoshiaki; and Tanaka, Takashi, 4,558,711, Cl. 133-3.00F.
Glover, Armond D.: *See*—
Call, Eugene H.; and Glover, Armond D., 4,558,876, Cl. 279-1.0DA.
Glover, Gary H.; and Kerwin, Edward M., to General Electric Company. X-Ray detector with compensation for height-dependent sensitivity and method of using same. 4,559,639, Cl. 378-19.000.
Glover, Richard W.: *See*—
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,558,470, Cl. 2-414.000.
Gobush, William: *See*—
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Goetze AG: *See*—
Vossieck, Paul; and vom Stein, Karl, 4,558,872, Cl. 277-88.000.
Golata, John H.; Saylor, David M.; Egan, William E.; and Goldstein, Arthur A., to Goodyear Tire & Rubber Company, The. Integral tire wheel. 4,558,727, Cl. 152-5.000.
Golberg, Jeffery O.: *See*—
Grove, Clinton E.; and Golberg, Jeffery O., 4,558,869, Cl. 277-1.000.
Goldberg, Ira B.; Chung, Kwang E.; and Fadner, Thomas A., to Rockwell International Corporation. Meter for measuring the concentration of water in a water-ink mixture. 4,559,493, Cl. 324-61.00R.
Goldberg, Michael L.: *See*—
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., 4,559,065, Cl. 55-161.000.
Goldrian, Gottfried, to International Business Machines Corporation. Time-measuring adapter for logic analyzer. 4,559,636, Cl. 377-20.000.
Goldstein, Arthur A.: *See*—
Golata, John H.; Saylor, David M.; Egan, William E.; and Goldstein, Arthur A., 4,558,727, Cl. 152-5.000.
Goldwasser, Dorothy: *See*—
Goldwasser, Eric; and Goldwasser, Dorothy, 4,559,598, Cl. 364-419.000.
Goldwasser, Eric; and Goldwasser, Dorothy. Method of creating text using a computer. 4,559,598, Cl. 364-419.000.
Golod, Leonid D.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.
Gomarasca, Piero; Scolastico, Carlo; and Sirtori, Cesare, to LBP Istituto Faraceutico S.p.A. Pyrimidine and s-triazine derivatives with antilipidemic activity. 4,559,345, Cl. 514-275.000.
Gonzales, Roman Y.: *See*—
Prager, Jay M.; and Gonzales, Roman Y., 4,558,914, Cl. 339-75.00R.
Goo, Atkin Y.; and Goo, Gee-In. Method and apparatus for encoding, storing and accessing characters of a Chinese character-based language. 4,559,615, Cl. 364-900.000.
Goo, Gee-In: *See*—
Goo, Atkin Y.; and Goo, Gee-In, 4,559,615, Cl. 364-900.000.
Goodhart, Milton E.: *See*—
Burton, James A.; Elkins, Hubert L.; and Goodhart, Milton E., 4,558,750, Cl. 175-61.000.
Goodrich, Judson E., to Chevron Research Company. Method for producing industrial asphalts. 4,559,128, Cl. 208-22.000.
Goodyear Tire & Rubber Company, The: *See*—
Golata, John H.; Saylor, David M.; Egan, William E.; and Goldstein, Arthur A., 4,558,727, Cl. 152-5.000.
Senyek, Michael L.; and Kolaczewski, Mitchell S., 4,559,374, Cl. 523-348.000.
Gorbik, Anatoly S.: *See*—
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Goryainov, Gennady E.: *See*—
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Beckmann, Friedrich K.; Dotsch, Horst; and Gossel, Dieter, 4,559,467, Cl. 313-359.100.

Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; Ludwig, Emil; Stark, Josef; Bauer, Bernhard; and Freund, Hans, to SKF Kugellagerfabriken GmbH. Process and apparatus for assembling universal joints. 4,558,502, Cl. 29-434.000.

Goto, Giichi: *See*—
Okutani, Tetsuya; and Goto, Giichi, 4,559,177, Cl. 260-396.00R.

Goto, Moritaka; and Kameoka, Takahito, to Fujikura Ltd. Electrical connector. 4,558,913, Cl. 339-74.00R.

Goto, Toshio: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,559,079, Cl. 71-92.000.

Gotz, Udo: *See*—
Hoffmann, Dietrich; and Gotz, Udo, 4,558,646, Cl. 102-527.000.

Gould Inc.: *See*—
Prager, Jay M.; and Gonzales, Roman Y., 4,558,914, Cl. 339-75.00R.

Goulstone, Ray T.; Gursky, Michael T.; and O'Boyle, John M., to AT&T Technologies, Inc. Guiding an advancing strip. 4,558,581, Cl. 72-379.000.

Graham, Joe. Towel warmer and holder. 4,559,442, Cl. 219-385.000.

Grantham, LeRoy F.: *See*—
Gay, Richard L.; and Grantham, LeRoy F., 4,559,170, Cl. 252-628.000.

Grau, Werner: *See*—
Heil, Guenter; Spoor, Herbert; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; Balz, Werner; and Lehner, August, 4,559,118, Cl. 204-159.140.

Greaves, Brian; and Ingham, Paul, to Dearborn Chemicals, Ltd. Process for dispersing particulate material in aqueous systems. 4,559,156, Cl. 252-82.000.

Green, Jerrold D.: *See*—
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.

Green, Laurence. Sliding sleeve drum sander. 4,558,538, Cl. 51-72.00R.

Green, Michael J., to BP Chemicals Limited. Transesterification of esters. 4,559,180, Cl. 260-463.000.

Greenwood, William S., to Thomas & Betts Corporation. Electrical connector. 4,558,915, Cl. 339-97.00C.

Grega nee Toth, Erzsebet: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.

Greiner, Donn B. Passive leg exerciser. 4,558,692, Cl. 128-25.00R.

Greskovics, Paul; and Chivens, Donald R., to Alopex Industries, Inc. Pool cleaner. 4,558,479, Cl. 15-1.700.

Griffith, Joseph W., to Tektronix, Inc. Air assisted hand held welding tool. 4,559,437, Cl. 219-86.210.

Grimes, Michael R.; and Vukovich, William J., to General Motors Corporation. Electronic control for a starting clutch. 4,558,772, Cl. 192-0.076.

Griner, Walter H.: *See*—
Lehtinen, Jukka A.; Karhola, Arvo K.; and Griner, Walter H., 4,558,960, Cl. 384-373.000.

Gringer, Donald. Scraper hand tool. 4,558,517, Cl. 30-169.000.

Gripenholt, Ninneh: *See*—
Berggren, Benny; and Gripenholt, Ninneh, 4,559,093, Cl. 156-96.000.

Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Pozovaniju Vtorichnykh Energoresursov Predpriyaty Chernoi Metallurgii "Vnipichermetenergoochistka". Cooling arrangement for shaft furnaces. 4,559,011, Cl. 432-233.000.

Grob, Jurgen; and Kalvoda, Jaroslav, to Ciba Geigy Corporation. 20-Spiroxanes and analogues having an open ring E, processes for their manufacture, and pharmaceutical preparations thereof. 4,559,332, Cl. 514-175.000.

Grohe, Klaus: *See*—
Petersen, Uwe; Grohe, Klaus; Kuhle, Engelbert; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,341, Cl. 514-254.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,342, Cl. 514-254.000.

Gromenko, Valentin V.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Groshong, LeRoy E.; and Brawn, Ronald J., to Catheter Technology Corporation. Apparatus for intravenous therapy and hyperalimentation. 4,559,046, Cl. 604-282.000.

Grosswendt, Werner: *See*—
Boeder, Dieter; and Grosswendt, Werner, 4,558,645, Cl. 102-489.000.

Groth, Hugh F., to Regina Corporation. Tank unit for cleaning devices. 4,558,484, Cl. 15-320.000.

Groth, Hugh F., to Regina Corporation. Spotting control and trigger assembly. 4,558,823, Cl. 239-413.000.

Grothaus, John F. Eyeglass display apparatus. 4,558,788, Cl. 211-13.000.

Grotnes Metalforming Systems, Inc.: *See*—
Fencl, Vernon R., 4,559,482, Cl. 318-50.000.

Grotta, Henry M., to Buffalo Color Corporation. Method for purifying cresidine sulfonic acid by resin extraction. 4,559,182, Cl. 260-509.000.

Grove, Clinton E.; and Golberg, Jeffery O., to Niwot Corporation. Covering for rotating flexible axle joints. 4,558,869, Cl. 277-1.000.

Groves, Oliver J.: *See*—
Oakley, David J.; and Groves, Oliver J., 4,558,982, Cl. 414-288.000.

Grundmann, Raban, to Huels Aktiengesellschaft. Process for producing bromomethylated polyphenylene ethers. 4,559,392, Cl. 525-390.000.

Grunsch, Eckhardt, to ANT Nachrichtentechnik GmbH. D.C. voltage converter including a pulse width controlled semiconductor switch. 4,559,591, Cl. 363-21.000.

Grutzner, Gunther, to Mannesmann Aktiengesellschaft. Using a corrosion proof austenitic iron chromium nickel nitrogen alloy for high load components. 4,559,090, Cl. 148-12.00E.

Guest, Donald K.; and Spector, George. Banjo mute. 4,558,625, Cl. 84-273.000.

Guetschow, Jimmy L.: *See*—
Sennett, Thomas; and Guetschow, Jimmy L., 4,559,105, Cl. 162-352.000.

Guile, Roy N.: *See*—
Johnson, Bruce V.; and Guile, Roy N., 4,559,628, Cl. 372-104.000.

Guitel, Jean-Claude; and le Faou, Daniel, to Ste Look. Rear element for a ski binding. 4,558,884, Cl. 280-620.000.

Gulko, George M.: *See*—
Jahnke, Frederick C.; Crouch, William B.; and Gulko, George M., 4,559,061, Cl. 48-63.000.

Gursky, Michael T.: *See*—
Goulstone, Ray T.; Gursky, Michael T.; and O'Boyle, John M., 4,558,581, Cl. 72-379.000.

Gutbrod Werke GmbH: *See*—
Klever, Manfred; and Schlosser, Guenther, 4,558,559, Cl. 56-16.400.

Guthrie, James L.; Roberts, Helen F.; and Lundsager, Christian B., to W. R. Grace & Co. Weldable sealants for metal and method of use. 4,559,373, Cl. 523-220.000.

Gutierrez, Richard: *See*—
Kay, Edward L.; Gutierrez, Richard; and Conard, Wendall R., 4,559,378, Cl. 524-147.000.

Gysling, Peter; and Vossoughi, Sohrab, to Hewlett Packard Company. Passive paper stacker. 4,559,031, Cl. 493-410.000.

Gyulavari, Imre, to Novex Talalmanyfejleszto es Novexesitolmalyereskedelmi Rt. Apparatus for the separation of solid and/or liquid particles from a liquid. 4,559,141, Cl. 210-521.000.

H. H. Robertson Company: *See*—
Albrecht, Raymond E.; and Lindner, Robert G., 4,558,544, Cl. 52-126.600.
Hieger, Richard A., 4,558,548, Cl. 52-235.000.

H. Krantz GmbH & Co.: *See*—
Cramer, Hans, 4,558,496, Cl. 26-95.000.

H. Maihak AG: *See*—
Ulrich, Reinhard; and Jansen, Klaus, 4,558,950, Cl. 356-345.000.

Haan, Wilhelmus A. O. Urinal with a check valve on a flaccid drain line. 4,559,049, Cl. 604-350.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; and Hans, Rudiger, 4,558,768, Cl. 188-343.000.

Haas, Steven L.; and Gobush, William, to Acushnet Company. Golf club shaft. 4,558,863, Cl. 273-77.00A.

Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Optimum shift position indication using successive two-dimensional data maps. 4,559,599, Cl. 364-424.100.

Hagar, Robert W.: *See*—
Eiserman, Gary K.; and Hagar, Robert W., 4,558,696, Cl. 128-205.120.

Hagita, Shoji: *See*—
Maruichi, Takanori; and Hagita, Shoji, 4,559,567, Cl. 360-10.300.

Hagler, Ernest; Roose, Charles A.; and Claypool, John B., to American Canvas Company. Frame system and connectors for portable shelters. 4,558,713, Cl. 135-106.000.

Hakkaku, Kunio: *See*—
Katsuragi, Shigeru; Hakkaku, Kunio; and Ogawa, Mutsuo, 4,559,565, Cl. 358-296.000.

Halas, Linda A.: *See*—
Wevers, Jean; Halas, Linda A.; and Peltre, Philippe R., 4,559,169, Cl. 252-543.000.

Halcon SD Group, Inc., The: *See*—
Hewlett, Colin, 4,559,183, Cl. 260-546.000.

Hale, Alan A., to General Electric Company. Drill with disposable inserts. 4,558,975, Cl. 408-186.000.

Hall, Anne L.: *See*—
Keyes, Gary S.; Belanger, Barry F.; and Hall, Anne L., 4,559,557, Cl. 358-111.000.

Halliburton Company: *See*—
Borchardt, John K.; and Young, Bill M., 4,558,741, Cl. 166-275.000.

Hallmark Cards, Inc.: *See*—
Sturdivan, James R., 4,558,980, Cl. 412-2.000.

Hamada, Akio: *See*—
Nakadate, Toshihiko; Namata, Morikuni; Hamada, Akio; and Tsujii, Gen, 4,559,438, Cl. 219-90.000.

Hamanaka, Toshiyuki: *See*—
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,559,193, Cl. 264-60.000.

Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Pump device. 4,558,992, Cl. 417-250.000.

Hamasaka, Kenneth B. Boot drying device. 4,559,440, Cl. 219-215.000.

Hammond, Clifton E., to Snyder Industries, Inc. Container with hinged lid. 4,558,799, Cl. 220-343.000.

Han, Wesley W.; and Roehrs, Robert E., to Alcon Laboratories, Inc. Nonirritating aqueous ophthalmic compositions comfort formulation for ocular therapeutic agents. 4,559,343, Cl. 514-264.000.

Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,558,660, Cl. 118-725.000.

Hanna, Marie R.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,559,168, Cl. 252-522.00A.

Hanover, Barry K.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,559,033, Cl. 604-49.000.

Hans, Rudiger: *See*—
Brandenstein, Manfred; Haas, Roland; and Hans, Rudiger, 4,558,768, Cl. 188-343.000.

Hansen, Gerhard. Tamper evident container. 4,558,793, Cl. 215-32.000.

Hansen, Herbert: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.

Hanson, Gary R.; and Rabuse, George R., to Minnesota Mining and Manufacturing Company. Strip of binding tape. 4,558,888, Cl. 281-23.000.

Hanson, James P. Disposable incontinence diaper. 4,559,051, Cl. 604-385.00R.

Hansson, Gunnar C., to Atlas Copco Aktiebolag. Pneumatic rotary grinding tool. 4,558,539, Cl. 51-170.00R.

Haour, Georges; Richter, Dag; and Wagnieres, Willy, to Battelle Development Corporation. Production of particulate or powdered metals and alloys. 4,559,187, Cl. 264-11.000.

Hara, Hisashi: *See*—
Iizuka, Tetsuya; and Hara, Hisashi, 4,559,548, Cl. 357-23.600.

Hara, Kazuo, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system. 4,558,677, Cl. 123-440.000.

Harada, Norimichi: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.

Harada, Susuma: *See*—
Ueda, Toshio; Kato, Tadashi; Mukai, Ryuichi; and Harada, Susumu, 4,559,391, Cl. 525-366.000.

Harcuba, Siegfried, to Harcuba, Theodor P.; and Anstalt, Interverre. Process and apparatus for producing glass. 4,559,072, Cl. 65-136.000.

Harcuba, Theodor P.: *See*—
Harcuba, Siegfried, 4,559,072, Cl. 65-136.000.

Hardee's Food Systems, Inc.: *See*—
Cunningham, William D., 4,558,528, Cl. 40-365.000.

Harms, John F., II, to Harmsco, Inc. End connected filter cartridges. 4,559,138, Cl. 210-316.000.

Harmsco, Inc.: *See*—
Harms, John F., II, 4,559,138, Cl. 210-316.000.

Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. LCD Hook-on digital ammeter. 4,559,496, Cl. 324-127.000.

Harnish, James R., to Borg-Warner Corporation. Batch-type water heating apparatus. 4,558,818, Cl. 236-25.00R.

Harris Corporation: *See*—
Young, William R.; and Parisoe, Leon F., 4,559,608, Cl. 364-786.000.

Harris, David H.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,559,175, Cl. 260-349.000.

Harris, Gerald R. Band saw apparatus and method. 4,558,614, Cl. 83-56.000.

Harris Graphics Corporation: *See*—
Duke, B. Michael; and Kempisty, Edward L., 4,558,859, Cl. 271-200.000.

Harris, William C., Jr., to S. C. Johnson & Son, Inc. Vapor-dispensing device. 4,558,820, Cl. 239-56.000.

Harrow, Jeffrey J.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,559,033, Cl. 604-49.000.

Harter, Richard M.: *See*—
Ramsdale, Kurt A.; and Harter, Richard M., 4,559,507, Cl. 331-183.000.

Hartley, James T.: *See*—
Moulin, Norbert L.; and Hartley, James T., 4,558,501, Cl. 29-271.000.

Hartmann, Heinrich: *See*—
Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, 4,559,159, Cl. 252-174.240.

Hartmann, Werner: *See*—
Nitschmann, Karl; Linke, Wilfried; Dietzsch, Gunter; Hartmann, Werner; Kaiser, Hans-Georg; Meyle, Werner; and Dolata, Hans, 4,558,621, Cl. 83-834.000.

Harvey Hubbell Incorporated: *See*—
Quiogue, Honesto D.; and Lewin, Ian, 4,559,587, Cl. 362-147.000.

Hase, Christian; and Koeppelmann, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Organic cyanamide compounds as activators for inorganic per compounds. 4,559,158, Cl. 252-102.000.

Hasegawa, Akira; and Kodama, Yuji, to AT&T Bell Laboratories. Soliton fiber telecommunication systems. 4,558,921, Cl. 350-96.290.

Hasegawa, Shumpei; and Shiraiwa, Michitaka, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine. 4,558,682, Cl. 123-589.000.

Hashimoto, Masami: *See*—
Ueda, Hiroshi; Matsumoto, Takeshi; and Hashimoto, Masami, 4,558,717, Cl. 137-596.000.

Hashimoto, Mitsuo; Watanabe, Yasuo; Mama, Fumio; and Odan, Akinori, to Nippon Petroleum Refining Company, Limited. Fuel burning method in heating furnace. 4,559,007, Cl. 431-4.000.

Hashimoto, Seiji; and Tanaka, Nobuyoshi, to Canon Kabushiki Kaisha. Noise reducing circuit. 4,559,559, Cl. 358-167.000.

Hassel, Goran: *See*—
Danielsson, Marcus; Ljunglof, Karl O.; and Hassel, Goran, 4,558,787, Cl. 209-626.000.

Hatada, Koichi; Okamoto, Yoshio; and Kitayama, Tatsuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Graft copolymers, process for the preparation thereof and ionizing radiation sensitive resist using such copolymers. 4,559,389, Cl. 525-250.000.

Hauck Manufacturing Company: *See*—
Marino, John A.; Strohl, Roderick G., Jr.; and Yost, Robert B., 4,559,009, Cl. 431-184.000.

Hauni-Werke Korber & Co. KG.: *See*—
Heitmann, Uwe; and Muller, Heidi, 4,558,586, Cl. 73-38.000.

Hawkins, Gilbert A., to Eastman Kodak Company. Backside gettering of silicon wafers utilizing selectively annealed single crystal silicon portions disposed between and extending into polysilicon portions. 4,559,086, Cl. 148-1.500.

Hawkins, Ronald G.: *See*—
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.

Hayafuji, Yoshinori, to Sony Corporation. Method for recrystallizing a polycrystalline, amorphous or small grain material. 4,559,102, Cl. 156-605.000.

Hayakawa Rubber Co. Ltd.: *See*—
Yamaji, Hajime; and Kobayashi, Takeshi, 4,558,875, Cl. 277-227.000.

Hayakawa, Yoshitaka, to Mitsubishi Denki Kabushiki Kaisha. Method for performing automatic circumferential welding. 4,559,430, Cl. 219-61.000.

Hayashi, Ikuo; Ogihara, Keizo; Itikawa, Tadao; and Shimizu, Kiyoshi, to Nitto Boseki. Process for acylation with novel acylating agent. 4,559,172, Cl. 260-112.50R.

Hayashi, Katsumi: *See*—
Dorer, Casper J., Jr.; and Hayashi, Katsumi, 4,559,155, Cl. 252-73.000.

Hayashi, Masaru; and Okumura, Tomoyuki, to NGK Insulators, Ltd. Heating process for solidifying a crud. 4,559,171, Cl. 252-629.000.

Hayashi, Tsutomu: *See*—
Uchibaba, Kouichi; Hayashi, Tsutomu; Ishikawa, Haruo; and Ohzono, Kouhei, 4,559,023, Cl. 464-30.000.

Hazel, Robert L.; and Chan, Gilbert Y., to Burroughs Corporation. Optical memory system providing improved focus detection and control by detecting reflected beam diameter variations at spaced predetermined locations in the system. 4,559,622, Cl. 369-45.000.

Hazenbroek, Jacobus E.; and Wallbridge, William L. Poultry cut up machine. 4,558,490, Cl. 17-52.000.

Hedin, Raymond C.; and Hewitt, Fred G., to United States of America, Air Force. Wide angle optical transmitter/receiver. 4,559,445, Cl. 250-203.00R.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymer modified cyanate and/or cyanamide compositions. 4,559,399, Cl. 528-120.000.

Hegenstaller, Anton. Pallet cleat and method of making same. 4,559,194, Cl. 264-113.000.

Heggenstaller, Anton. Pressed-material pallet cleat and method and mold for making same. 4,559,195, Cl. 264-120.000.

Hehl, Karl. Multi-pin plug connection system for electronic control unit. 4,558,916, Cl. 339-107.000.

Heide, Wolfgang M.: *See*—
Freund, Hans-Ulrich; Heide, Wolfgang M.; and Sieglen, Rolf A., 4,558,752, Cl. 175-207.000.

Heil, Guenter; Spoor, Herbert; Lenz, Werner; Kovacs, Jence; Grau, Werner; Balz, Werner; and Lehner, August, to BASF Aktiengesellschaft. Magnetic recording media. 4,559,118, Cl. 204-159.140.

Heinen, Hans-Dieter J., to Intellectual Trade Cy S.A. Fire-guard composition and method for preparing same. 4,559,368, Cl. 521-91.000.

Heinrich Kopp GmbH & Co. KG.: *See*—
Franz, Herbert, 4,559,510, Cl. 335-13.000.

Heinrich Mack Nachf.: *See*—
Stoss, Peter; and Leitold, Matyas, 4,559,351, Cl. 514-338.000.

Heinsohn, Alfred W.: *See*—
Swearingen, Loren L.; Heinsohn, Alfred W.; Snook, Craig W.; Embrey, Wallace E.; and McConchie, Garnet E., 4,559,110, Cl. 203-37.000.

Heitkamp, Herbert: *See*—
Unger, Eberhart; and Heitkamp, Herbert, 4,558,629, Cl. 91-29.000.

Heitmann, Uwe; and Muller, Heidi, to Hauni-Werke Korber & Co. KG. Apparatus for stabilizing the pressure of gaseous testing fluid for cigarettes and the like. 4,558,586, Cl. 73-38.000.

Heizler, Fritz: *See*—
Becker, Carl; and Heizler, Fritz, 4,559,150, Cl. 252-8.600.

Held, Jan H.: *See*—
Eijkelenkamp, Antonius J. H.; Held, Jan H.; and Rientjes, Gerardus J. A., 4,559,581, Cl. 361-433.000.

Helioprint AS: *See*—
Andersen, Steen, 4,558,945, Cl. 355-68.000.

Heller, Rudolf, to Contraves AG. Operating table. 4,558,857. Cl. 269-325.000.

Hemmes, Paul R., to Miles Laboratories, Inc. Ultrasonic coagulation monitor and method. 4,558,589, Cl. 73-64.100.

Hendriks, Leonard P.: *See*—
Muir, Colin W. A.; and Hendriks, Leonard P., 4,559,209, Cl. 423-30.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Hase, Christian; and Koeppelmann, Edgar, 4,559,158, Cl. 252-102.000.

Henne, Andreas: *See*—
Tesch, Helmut; Henne, Andreas; Heym, Manfred; and Stutz, Herbert, 4,559,398, Cl. 528-94.000.

Henry, Dominique: *See*—
Duret, Robert; and Henry, Dominique, 4,559,474, Cl. 315-3.600.

Henry Ford Hospital: *See*—
Wu, Kent K., 4,558,697, Cl. 128-303.00R.

Hensley, Albert L., Jr.: *See*—
Miller, Jeffrey T.; and Hensley, Albert L., Jr., 4,559,363, Cl. 518-711.000.

Herbert, James F., to Metal Closures Limited. Application heads for applying closures to containers. 4,558,554, Cl. 53-331.500.

Herbert, Kenneth, Jr. Method for repairing fiberglass boat hulls. 4,559,240, Cl. 427-140.000.

Herbert, Manfred: *See*—
Schmitt, Reinhold; Herbert, Manfred; and Baur, Walter, 4,558,779, Cl. 198-627.000.

Herbert Richter Metallwaren-Apparate bau GmbH & Co.: *See*—
Richter, Herbert, 4,558,469, Cl. 2-60.000.

Herchenbach, Wolfgang, to Rodi & Wienenberger AG. Wrist watch. 4,558,955, Cl. 368-282.000.

Herd, Karl J.: *See*—
Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, 4,559,296, Cl. 430-519.000.

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Herrick, Carlyle S., to General Electric Company. Reducing powder formation in the production of high-purity silicon. 4,559,219, Cl. 423-350.000.

Herrmann, Hans-Ulrich: *See*—
Burli, Martin; Bersier, Jacques; Plattner, Eric; and Herrmann, Hans-Ulrich, 4,559,176, Cl. 260-352.000.

Herschler, Robert J. Dietary and pharmaceutical uses of methyl-sulfonylmethane and compositions comprising it. 4,559,329, Cl. 514-164.000.

Herstein, Barry S.; and Mondini, Anthony J., to Buddy L Corporation. Toy vehicle with simulated headlights. 4,559,022, Cl. 446-438.000.

Herter, Rolf: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.

Herwig, Walter: *See*—
Geissler, Ulrich; Herwig, Walter; and Sikora, Helga, 4,559,292, Cl. 430-256.000.

Herzog, Reinhold: *See*—
Rock, Siegfried; Rainer, Hans-Peter; Herzog, Reinhold; Wertitsch, Werner; Kromus, Gunter; and Kolbl, Fritz, 4,558,638, Cl. 98-88.100.

Heterene Chemical Company, Inc.: *See*—
Fogel, Arnold W.; and Smith, Ronald J., 4,559,226, Cl. 424-66.000.

Hettche, Albert: *See*—
Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, 4,559,159, Cl. 252-174.240.

Hetyei, Joseph; and Letocquart, Bruno, to Thomson-CSF. Microwave landing system with protection against jamming. 4,559,538, Cl. 343-412.000.

Hewitt, Fred G.: *See*—
Hedin, Raymond C.; and Hewitt, Fred G., 4,559,445, Cl. 250-203.00R.

Hewlett, Colin, to Halcon SD Group, Inc., The. Preparation of carboxylic acid anhydrides. 4,559,183, Cl. 260-546.000.

Hewlett Packard Company: *See*—
Gysling, Peter; and Vossoughi, Sohrab, 4,559,031, Cl. 493-410.000.

Heym, Manfred: *See*—
Tesch, Helmut; Henne, Andreas; Heym, Manfred; and Stutz, Herbert, 4,559,398, Cl. 528-94.000.

Hezzell, David J.: *See*—
Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., 4,559,262, Cl. 428-294.000.

Hicks, Joel T.: *See*—
Isbell, Benny R.; and Hicks, Joel T., 4,558,523, Cl. 34-30.000.

Hieger, Richard A., to H. H. Robertson Company. Non-displaceable shim. 4,558,548, Cl. 52-235.000.

Hill, Arthur: *See*—
Sims, Cecil W.; and Hill, Arthur, 4,559,487, Cl. 322-24.000.

Hill, Edward C.: *See*—
Kisling, Douglas L.; Hill, Edward C.; and Delahoussaye, Ronald D., 4,558,988, Cl. 416-220.00R.

Hill, Martha A.: *See*—
Zajic, James E.; Hill, Martha A.; Manchester, Donald F.; and Muzika, Karel, 4,559,305, Cl. 435-243.000.

Hiller, Heinz; Supp, Emil; Marschner, Friedemann; Kupfer, Hans; and Weidemann, Lutz, to Metallgesellschaft AG. Reactor for producing methanol and process. 4,559,207, Cl. 422-197.000.

Hiller, John J., Jr.: *See*—
Pregozen, David; and Hiller, John J., Jr., 4,559,151, Cl. 252-8.800.

Hippely, Keith A., to Mattel, Inc. Toy vehicle trackway set. 4,558,867, Cl. 273-412.000.

Hirai, Masaru: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,559,179, Cl. 260-456.00F.

Hiramatsu, Takeo: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,558,612, Cl. 74-844.000.

Hirano, Hideo: *See*—
Hori, Michimasa; Hirano, Hideo; Kojima, Yoshinori; and Yuda, Jiro, 4,558,993, Cl. 417-283.000.

Hirano, Koki, to Jidosha Denki Kogyo Kabushiki Kaisha. Stop-position controlling device for electric windshield wiper. 4,559,484, Cl. 318-443.000.

Hiraoka, Bunsho; Tanaka, Tsutomu; and Okane, Koji, to Sumitomo Metal Industries, Ltd. Apparatus for gasification of solid carbonaceous material. 4,559,062, Cl. 48-92.000.

Hirayama, Ryoichi: *See*—
Misasa, Mitsugu; and Hirayama, Ryoichi, 4,559,266, Cl. 428-341.000.

Hirooka, Masaaki; Toma, Hitoshi; and Kondo, Hideyo, to Canon Kabushiki Kaisha. Image holding member having protective layers. 4,559,260, Cl. 428-215.000.

Hirose, Fumio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.

Hirth, Georges; Petrzilka, Martin; and Pracht, Inge, to Hoffmann-La Roche Inc. Optical immersion oil. 4,559,147, Cl. 252-1.000.

Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, to Daikan Kogyo Co., Ltd. Fluorine-containing vinyl compound. 4,559,179, Cl. 260-456.00F.

Hisatsune, Fumiyuki: *See*—
Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, 4,559,423, Cl. 200-144.00R.

Hiskes, John R.: *See*—
Leung, Ka-Ngo; Ehlers, Kenneth W.; and Hiskes, John R., 4,559,477, Cl. 315-111.810.

Hitachi Chemical Company, Ltd.: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,559,295, Cl. 430-325.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Watanabe, Hiroshi; and Izumi, Eiki, 4,558,593, Cl. 73-168.000.

Hitachi, Ltd.: *See*—
Ichikawa, Akira; and Matsuzaka, Hiroko, 4,559,604, Cl. 364-513.500.
Kan, Kazutoshi; and Oizumi, Junichi, 4,559,633, Cl. 375-1.000.
Kobayashi, Hideaki, 4,559,463, Cl. 310-156.000.
Koike, Norio; Ohba, Shinya; and Masuhara, Toshiaki, 4,559,550, Cl. 357-24.000.
Kumasaka, Noriyuki; Fujiwara, Hideo; Otomo, Shigekazu; Yamashita, Takeo; Takayama, Shinji; Saito, Noritoshi; Kobayashi, Nobuo; and Kudo, Mitsuhiro, 4,559,572, Cl. 360-110.000.
Murata, Toshinori; Ito, Yuji; and Kazumi, Masafumi, 4,559,560, Cl. 358-167.000.
Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Morihisa, 4,559,060, Cl. 44-23.000.
Ninomiya, Ken; Nishimatsu, Shigeru; Suzuki, Keizo; Okudaira, Sadayuki; and Ogawa, Yoshifumi, 4,559,100, Cl. 156-345.000.
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Nishimura, Yutaka; Kuroiwa, Hiroshi; Oyama, Yoshishige; and Teranishi, Takao, 4,558,678, Cl. 123-494.000.
Okado, Terumi; and Sugiura, Noboru, 4,558,674, Cl. 123-425.000.
Sato, Toshihiro; Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Sugita, Yutaka, 4,559,617, Cl. 365-36.000.
Shimode, Shinichi; and Sato, Shigenori, 4,559,255, Cl. 428-138.000.
Shiraki, Yasuhiro; Murayama, Yoshimasa; Katayama, Yoshifumi; and Maruyama, Eiichi, 4,559,547, Cl. 357-23.200.
Yoshinaga, Shinya; and Iwamura, Hiroyuki, 4,558,571, Cl. 62-238.600.

Hite, John B.; and Reynolds, Matthew R. Belt fastener. 4,558,492, Cl. 24-37.000.

Hittel, William C.: *See*—
O'Boyle, Dolores; and Hittel, William C., 4,558,705, Cl. 128-476.000.

Hiujsing, Johan H., to Signetics Corporation. Multi-stage amplifier with capacitive nesting for frequency compensation. 4,559,502, Cl. 330-294.000.

Hochschild, James R., to Texas Instruments Incorporated. PSK Modem having dual-integrator voltage controlled oscillator. 4,559,634, Cl. 375-9.000.
Hoda, Syed N.; and Olszewski, Anthony R., to Corning Glass Works. Synthetic mica products. 4,559,264, Cl. 428-324.000.
Hoechst Aktiengesellschaft: *See—*
Geissler, Ulrich; Herwig, Walter; and Sikora, Helga, 4,559,292, Cl. 430-256.000.
Hoefelmayr, Tilman, to Biomelktechnik Hoefelmayr & Co. Air inlet valve for admitting air to the milk drain conduit of a teat cup or collector piece. 4,558,843, Cl. 251-61.000.
Hoffman, Craig A.; Meyer, Jerry R.; and Bartoli, Filbert, to United States of America, Navy. Picosecond bistable optical switch using two-photon transitions. 4,558,923, Cl. 350-354.000.
Hoffmann, Dietrich; and Gotz, Udo, to Mauser-Werke Oberndorf GmbH. Projectile body with a rotating band of plastic. 4,558,646, Cl. 102-527.000.
Hoffmann, Gerhard, to BASF Aktiengesellschaft. Electrophotographic recording materials containing a metal acetylacetonate. 4,559,285, Cl. 430-49.000.
Hoffmann-La Roche Inc.: *See—*
Barner, Richard; and Hubscher, Josef, 4,559,407, Cl. 549-548.000.
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.
Hirth, Georges; Petrzilka, Martin; and Pracht, Inge, 4,559,147, Cl. 252-1.000.
Hogan, Thomas B. Brake assembly for bicycle. 4,558,765, Cl. 188-24.190.
Hojnoski, David E., to Jalger Limited. Insert for a container for aging wine. 4,558,639, Cl. 99-277.100.
Holcombe, Cressie E., to United States of America, Energy. Microwave coupler and method. 4,559,429, Cl. 219-10.55F.
Holgate Corporation: *See—*
Phillips, William H., 4,558,534, Cl. 43-9.000.
Hollaway, Gerald C.: *See—*
Miranti, Joseph P., Jr.; Foley, Mark P.; Hollaway, Gerald C.; Oliver, Larry R.; Standley, Paul M.; and Lewis, James A., 4,559,029, Cl. 474-251.000.
Holmes, Michael: *See—*
Caddy, Stephen W.; and Holmes, Michael, 4,558,684, Cl. 123-609.000.
Holubka, Joseph W.; and Dickie, Ray A., to Ford Motor Company. Chain-extendable crosslinkable urethane modified polyhydroxy oligomers and coating composition comprising same. 4,559,383, Cl. 524-542.000.
Holubka, Joseph W., to Ford Motor Company. Crosslinkable composition comprising aminoepoxy resin - III. 4,559,393, Cl. 525-531.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, 4,559,249, Cl. 428-36.000.
Furukawa, Yoshimi; Sano, Shoichi; and Takamatsu, Hiroshi, 4,558,877, Cl. 280-91.000.
Hasegawa, Shumpei; and Shiraiwa, Michitaka, 4,558,682, Cl. 123-589.000.
Inagaki, Takashi; Fujita, Yasumasa; and Izawa, Shinichiro, 4,558,667, Cl. 123-90.440.
Nakadate, Toshihiko; Numata, Morikuni; Hamada, Akio; and Tsujii, Gen, 4,559,438, Cl. 219-90.000.
Shirakura, Masaru, 4,558,566, Cl. 60-314.000.
Uchibaba, Kouichi; Hayashi, Tsutomu; Ishikawa, Haruo; and Ohzono, Kouhei, 4,559,023, Cl. 464-30.000.
Honda, Keijiro: *See—*
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,559,295, Cl. 430-325.000.
Honeywell Inc.: *See—*
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Honeywell Information Systems Inc.: *See—*
Boudreau, Daniel A.; Salas, Edward R.; and Sandini, James M., 4,559,595, Cl. 364-200.000.
Kaplan, Jay; and Marchant, Ray, 4,558,839, Cl. 248-542.000.
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, to Matsushita Electric Industrial Co., Ltd. Electrode on heat-resisting and isolating substrate. 4,559,279, Cl. 428-632.000.
Honshu Seishi Kabushiki Kaisha: *See—*
Nomura, Yoshika; Sano, Susumu; and Shoji, Sadahiro, 4,559,103, Cl. 162-160.000.
Hood, Paul F., to General Motors Corporation. Catalytic converter substrate and retainer assembly. 4,559,205, Cl. 422-180.000.
Hoogovens Groep B.V.: *See—*
Bus, Isaak; and Mooij, Joop N., 4,559,113, Cl. 204-15.000.
Hoover, Merle V., to RCA Corporation. Radio-frequency amplifier. 4,559,476, Cl. 315-39.000.
Hopkins, Thomas R., to Phillips Petroleum Company. Treatment of yeast cells with proteolytic enzymes. 4,559,307, Cl. 435-272.000.
Horansky, Frank J.: *See—*
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.
Hori, Michimasa; Hirano, Hideo; Kojima, Yoshinori; and Yuda, Jiro, to Matsushita Electric Industrial Co., Ltd. Rotary compressor with capacity modulation. 4,558,993, Cl. 417-283.000.
Hori, Takahiro: *See—*
Obitsu, Masamichi; and Hori, Takahiro, 4,559,241, Cl. 427-140.000.
Horiba, Ltd.: *See—*
Baba, Yasuo; and Asano, Ichiro, 4,559,492, Cl. 324-83.00D.
Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,559,201, Cl. 422-63.000.
Horikawa, Yoshiaki, to Olympus Optical Co., Ltd. Image information processing device. 4,559,645, Cl. 382-65.000.
Horike, Masanori: *See—*
Furukawa, Tatsuya; and Horike, Masanori, 4,558,995, Cl. 417-322.000.
Horner, Herbert F., Jr.; Zenner, Michael M.; Nowack, Daniel P.; and Christopherson, Herman P., to Toro Company, The. Lawn mower traction control system. 4,558,558, Cl. 56-11.300.
Hornyak, Gyula: *See—*
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.
Horres, Russell; and Moers, John W., to Pancretec, Inc. Segmented peristaltic pump chamber. 4,559,040, Cl. 604-153.000.
Horton, Gilbert L.; Poole, Eddie D.; and Foreman, John W., Jr., to Sara Lee Corporation. Label advancing system for a line closer machine. 4,558,653, Cl. 112-262.200.
Hoshino, Yuji; Endou, Hajime; and Suda, Kazuyoshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Method and apparatus for mobilizing geothermal fluid. 4,558,568, Cl. 60-641.500.
Hosogai, Setsuo: *See—*
Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, 4,559,423, Cl. 200-144.00R.
Hosogoe, Junichi, to Alps Electric Co., Ltd. X-Y Position input device for display system. 4,559,532, Cl. 340-710.000.
Hosomizu, Hiroshi: *See—*
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.
Hosono, Yoshio: *See—*
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.
Hosoya, Masahiro: *See—*
Nosaki, Takefumi; Tanimoto, Koji; and Hosoya, Masahiro, 4,558,941, Cl. 355-3.0DD.
Hosoya, Mitsuru; Tsuchiya, Takao; and Toyoda, Naokuni, to Sony Corporation. Picture quality adjusting circuit. 4,559,558, Cl. 358-162.000.
Hostetler, John E.; Hulsebusch, William H.; and Sears, I. Weir, to Sears Manufacturing Company. Process for forming cushion articles. 4,559,094, Cl. 156-212.000.
Hostetter, David L., to Kimball International, Inc. Access panel. 4,559,410, Cl. 174-48.000.
Hostettler, Fritz, to Pirri, Jaquelyn P., a part interest. Preparation of microcellular polyurethane elastomers. 4,559,366, Cl. 521-51.000.
Hou, Kenneth C., to AMF Incorporated. Process for preparing a zero standard serum. 4,559,145, Cl. 210-679.000.
Houseman, David L.; and Bowden, Paul, to Data General Corp. Content-addressable memory module with associative clear. 4,559,618, Cl. 365-49.000.
Howard, Donald K.; Finan, Michael A.; and Lees, Michael J., to Ciba Geigy Corporation. Particulate calcium carbonate. 4,559,214, Cl. 423-430.000.
Howard, H. Keith; and Sherrill, Jimmy L., to Tutco, Inc. Coil support insulator for an electric heater. 4,559,412, Cl. 174-138.00J.
Howard, Robert G., Sr. Oil well casing scraper. 4,558,738, Cl. 166-173.000.
Hsiao, Cheng-Kuo: *See—*
Kazmaier, Peter M.; Baranyi, Giuseppa; Hsiao, Cheng-Kuo; and Burt, Richard A., 4,559,286, Cl. 430-59.000.
Hsu, Joanna K.: *See—*
Felix, Raymond A.; and Hsu, Joanna K., 4,559,082, Cl. 71-98.000.
Huang, Wann-Sheng; and Brown, Alfred, to Texaco Inc. Method and apparatus for gravel packing horizontal wells. 4,558,742, Cl. 166-278.000.
Hubscher, Josef: *See—*
Barner, Richard; and Hubscher, Josef, 4,559,407, Cl. 549-548.000.
Hudson, James E., Jr.: *See—*
Robinson, Thomas P.; Killman, Don M.; Mattson, Andrew P.; and Hudson, James E., Jr., 4,559,044, Cl. 604-246.000.
Huels Aktiengesellschaft: *See—*
Grundmann, Raban, 4,559,392, Cl. 525-390.000.
Huffaker, Roger W., to Exxon Production Research Co. Apparatus for transporting equipment through a conduit. 4,558,751, Cl. 175-99.000.
Hughes Aircraft Company: *See—*
Moulin, Norbert L.; and Hartley, James T., 4,558,501, Cl. 29-271.000.
Oldham, Susan L., 4,559,272, Cl. 428-418.000.
Hughes, Ronald M.: *See—*
Palmer, Christopher W.; and Hughes, Ronald M., 4,558,766, Cl. 188-79.50B.
Huhn, Karl; and Ullrich, Kurt, to Wacker-Chemie GmbH. Method for preparing aqueous emulsions. 4,559,385, Cl. 524-838.000.
Huhtala, Marja-Liisa: *See—*
Stenman, Ulf-Hakan; and Huhtala, Marja-Liisa, 4,559,311, Cl. 436-542.000.
Hulse, Ian: *See—*
Roach, Peter F.; Duncombe, Edward; and Hulse, Ian, 4,559,436, Cl. 219-85.00M.
Hulsebusch, William H.: *See—*
Hostetler, John E.; Hulsebusch, William H.; and Sears, I. Weir, 4,559,094, Cl. 156-212.000.

Hult, Timothy D.: *See—*
Craighead, Norwood D., II; Preliasco, Richard J.; and Hult, Timothy D., 4,558,967, Cl. 403-113.000.

Hunkapiller, Michael W. Zero dead volume valve. 4,558,845, Cl. 251-331.000.

Hunt, Charles d'A., to Demetron, Inc. Method for high vacuum casting. 4,558,729, Cl. 164-122.000.

Hunter, George S.; Walker, Brian; and Merrie, Kenneth, to Process Scientific Innovations Limited. Filters for purification of gases. 4,559,066, Cl. 55-274.000.

Hurps, Richard L.; and Suh, Kyung W., to Dow Chemical Company, The. Combination blowing agent and filler for thermoplastic foams. 4,559,367, Cl. 521-79.000.

Hurst, Jim; and May, Josephine B., to Beecham Group, p.l.c. 5- And/or 7-substituted pyrazolo-[4,3-b]-pyridines and their use as antiinflammatory agents. 4,559,348, Cl. 514-303.000.

Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, to Ciba Geigy Corporation. Photocurable colored compositions employing alpha-amino phenone initiator. 4,559,371, Cl. 204-158.00R.

Hutchinson S.A.: *See—*
Forneris, Alexandre, 4,558,728, Cl. 152-400.000.

Hwang, Eddie Y.; Shung, Wu-Shi; and Osborne, Robert L., to Westinghouse Electric Corp. Stuck pushbutton contingency operation for a steam turbine control system. 4,558,569, Cl. 60-657.000.

Hydril Company: *See—*
Burton, James A.; Elkins, Hubert L.; and Goodhart, Milton E., 4,558,750, Cl. 175-61.000.
Muchow, John D., 4,558,716, Cl. 137-269.000.

Ichihashi, Hiroo: *See—*
Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 4,559,543, Cl. 346-140.00R.

Ichikawa, Akira; and Matsuzaka, Hiroko, to Hitachi, Ltd. Pattern recognition method. 4,559,604, Cl. 364-513.500.

Ichikawa Woolen Textile Co., Ltd.: *See—*
Kiuchi, Masao, 4,559,258, Cl. 428-156.000.

Idemitsu Petrochemical Co., Ltd.: *See—*
Misasa, Mitsugu; and Hirayama, Ryoichi, 4,559,266, Cl. 428-341.000.

Iemura, Shigeru; and Kawano, Akira, to Matsushita Graphic Communication Systems, Inc. Recording apparatus. 4,559,545, Cl. 346-155.000.

Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, to Fujitsu Limited. Apparatus for detecting edge of semitransparent plane substance. 4,559,452, Cl. 250-560.000.

Ihde, Richard C., to Champion International Corporation. Reinforcement for bottom major horizontal score line of container. 4,558,814, Cl. 229-17.00R.

Iida, Kazumi: *See—*
Tamura, Kazuhisa; Iida, Kazumi; and Koshimo, Masahiko, 4,559,024, Cl. 464-63.000.

Iijima, Toshio: *See—*
Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Kido, Keishiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,559,289, Cl. 430-66.000.

Iizuka, Tetsuya; and Hara, Hisashi, to Tokyo Shibaura Denki Kabushiki Kaisha. CMOS Charge pump free of parasitic injection. 4,559,548, Cl. 357-23.600.

Ikeda, Hiroaki, to NEC Corporation. Large capacity memory circuit with improved write control circuit. 4,559,619, Cl. 365-190.000.

Ikeda, Tadashi: *See—*
Sato, Toshihiro; Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Sugita, Yutaka, 4,559,617, Cl. 365-36.000.

Ikenaga, Yukio: *See—*
Kasaga, Takuzo; Ikenaga, Yukio; Yamawaki, Masami; and Tanimura, Keizo, 4,559,380, Cl. 524-317.000.

Ikuta Yoshiaki; and Tanaka, Takashi, to Glory Kogyo Kabushiki Kaisha. Coin processing apparatus. 4,558,711, Cl. 133-3.00F.

Ikuzawa, Masanori: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.

Imai, Nobuomi, to Primo Company Limited. Ceramic microphone. 4,559,418, Cl. 179-111.00E.

Imaizumi, Masaki, to Olympus Optical Co., Ltd. Focusing method for a telephoto lens system. 4,558,928, Cl. 350-454.000.

Imamura, Nobutake: *See—*
Tanaka, Shinsuke; Tanaka, Fujio; Nagao, Yasuyuki; Imamura, Nobutake; and Ota, Chuichi, 4,559,573, Cl. 360-131.000.

Imanari, Hitoshi: *See—*
Onori, Sachio; Naito, Hideshi; Imanari, Hitoshi; and Muryoi, Takeshi, 4,558,927, Cl. 350-429.000.

Imperial Chemical Industries, PLC: *See—*
Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., 4,559,262, Cl. 428-294.000.
Powell, Richard L., 4,559,154, Cl. 252-69.000.
Turnbull, Michael D., 4,559,353, Cl. 514-346.000.

Imperial Plastics, Inc.: *See—*
Iverson, Peter B.; and Gambell, John A., 4,558,782, Cl. 206-387.000.

Inagaki, Takashi; Fujita, Yasumasa; and Izawa, Shinichiro, to Honda Giken Kogyo Kabushiki Kaisha. Valve driving apparatus for an internal combustion engine. 4,558,667, Cl. 123-90.440.

Inagaki, Takefumi: *See—*
Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, 4,559,452, Cl. 250-560.000.

Inami, Mamoru: *See—*
Otsuki, Zenju; and Inami, Mamoru, 4,559,569, Cl. 360-65.000.

Indagraf S/A: *See—*
Navarrete, Juan A., 4,559,294, Cl. 430-306.000.

Indiana University Foundation: *See—*
Kesmodel, Lawrence L., 4,559,449, Cl. 250-305.000.

Industria Italiana Petroli S.p.A.: *See—*
Quintavalle, Saverio; and Gargani, Luciano, 4,559,190, Cl. 264-45.300.

Ingersoll Equipment Co., Inc.: *See—*
Manteufel, Dale A., 4,558,881, Cl. 280-460.00A.

Ingham, Paul: *See—*
Greaves, Brian; and Ingham, Paul, 4,559,156, Cl. 252-82.000.

Ingolia, Thomas D., to Eli Lilly and Company. DNA for directing transcription and expression of structural genes. 4,559,302, Cl. 435-172.300.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi; Shimizu, Akihiko; and Yabe, Jinzo, 4,558,977, Cl. 409-80.000.
Inoue, Kiyoshi, 4,559,115, Cl. 204-129.100.

Inoue, Kiyoshi; Shimizu, Akihiko; and Yabe, Jinzo, to Inoue-Japax Research Incorporated; and Japax Incorporated. NC Method and system for machining a 3D contour in a workpiece. 4,558,977, Cl. 409-80.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for machining ceramic materials. 4,559,115, Cl. 204-129.100.

Inoue, Toru: *See—*
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.

Institut Francais du Petrole: *See—*
Delignieres, Robert, 4,559,621, Cl. 367-130.000.

Institut Pasteur: *See—*
David, Bernard; Peltre, Gabriel; and Mecheri, Salah, 4,559,230, Cl. 424-91.000.

Intellectual Trade Cy S.A.: *See—*
Heinen, Hans-Dieter J., 4,559,368, Cl. 521-91.000.

International Business Machines Corporation: *See—*
Applegate, Steven L.; Molloy, James J.; and Wilbur, Clayton V., 4,558,963, Cl. 400-120.000.
Desai, Kishor V.; and Keusseyan, Roupen L., 4,558,590, Cl. 73-104.000.
Goldrian, Gottfried, 4,559,636, Cl. 377-20.000.
Kinney, Wayne I.; Koburger, Charles W., III; Lasky, Jerome B.; Nesbit, Larry A.; Troutman, Ronald R.; and White, Francis R., 4,558,508, Cl. 29-571.000.
Ostapko, Daniel L., 4,559,611, Cl. 364-900.000.
Peek, Charles L.; Richey, Phillip C.; and Summers, James H., 4,559,614, Cl. 364-900.000.
Schlotter, Nicholas E.; and Rabolt, John F., 4,559,447, Cl. 250-231.0SE.
Tiwari, Sandip, 4,558,509, Cl. 29-576.00B.

International Coal Refining Company: *See—*
Ying, David H. S.; McDermott, Wayne T.; and Givens, Edwin N., 4,558,651, Cl. 110-347.000.

International Flavors & Fragrances Inc.: *See—*
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,559,168, Cl. 252-522.00A.

International Packaging Systems Inc.: *See—*
O'Malley, Michael P., 4,559,192, Cl. 264-51.000.

International Paper Company: *See—*
Gordon, Robert L., 4,558,785, Cl. 206-617.000.

International Playtex, Inc.: *See—*
O'Boyle, Dolores; and Hittel, William C., 4,558,705, Cl. 128-476.000.

International Telephone and Telegraph Corporation: *See—*
Jezo, Maurice L.; and Lu, Ning H., 4,559,606, Cl. 364-728.000.
Lu, Ning H., 4,559,607, Cl. 364-728.000.

Inumaru, Susumu: *See—*
Yoshida, Masahiro; and Inumaru, Susumu, 4,558,730, Cl. 164-487.000.

Irikura, Tsutomu; Suzue, Seigo; Okubo, Hideo; and Awano, Katsuya, to Kyorin Seiyaki Kabushiki Kaisha. Pyrazolopyridines and tetrahydro pyrazolopyridines. 4,559,402, Cl. 546-121.000.

Irwin, James S.: *See—*
Suarez, Jose I.; Irwin, James S.; and Shepherd, Wayne P., 4,559,505, Cl. 331-1.00A.

Isayama, Takuro: *See—*
Matsumoto, Shuzo; Isayama, Takuro; Yamazaki, Hiroshi; and Katano, Yasuo, 4,559,544, Cl. 346-140.00R.

Isbell, Benny R.; and Hicks, Joel T., to Isbell, Benny R. Method and apparatus for equilibrium drying of grain. 4,558,523, Cl. 34-30.000.

Iscar Ltd.: *See—*
Pano, Joseph, 4,558,974, Cl. 407-50.000.

Isgar, Charles B.; and Isgar, Shirley K. Bag support system. 4,558,800, Cl. 220-403.000.

Isgar, Charles B. Knowledge game apparatus and method and card caddy therefor. 4,558,865, Cl. 273-148.00A.

Isgar, Shirley K.: *See—*
Isgar, Charles B.; and Isgar, Shirley K., 4,558,800, Cl. 220-403.000.

Ishigure, Masao; Ota, Mitsuo; Takaoka, Naotoshi; and Kudomi, Mitsuharu, to Takamatsu Electric Works, Ltd. Overcurrent condition display. 4,559,530, Cl. 340-664.000.

Ishikawa, Haruo: *See—*
Uchibaba, Kouichi; Hayashi, Tsutomu; Ishikawa, Haruo; and Ohzono, Kouhei, 4,559,023, Cl. 464-30.000.

Ishikawa, Masanobu: *See*—
Okuyama, Teiji; Kuwana, Kazutaka; and Ishikawa, Masanobu, 4,558,897, Cl. 296-1.00S.
Ishikawa, Yasuki; Sone, Masazumi; and Kawai, Akio, to Nissan Motor Co., Ltd. Engine ignition device. 4,558,685, Cl. 123-620.000.
Ishikawa, Yuji: *See*—
Matsumoto, Hiroshi; Ishikawa, Yuji; and Nakamine, Chosin, 4,559,519, Cl. 340-286.00M.
Ishizaka, Sunao; and Maida, Osamu, to Nippon Kogaku K. K. Camera provided with means for detecting information on film cartridge. 4,558,935, Cl. 354-21.000.
Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Ishizuka, Masaaki, 4,559,362, Cl. 514-674.000.
Iskra, Michael J., to Personal Products Company. Thin, soft, absorbent product. 4,559,050, Cl. 604-368.000.
Itikawa, Tadao: *See*—
Hayashi, Ikuo; Ogihara, Keizo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,559,172, Cl. 260-112.50R.
Ito, Hiroshi: *See*—
Murakami, Katsuo; Yamazaki, Hitoshi; Tanaka, Norihiko; and Ito, Hiroshi, 4,559,470, Cl. 313-487.000.
Ito, Masaya, to NGK Spark Plug Co., Ltd. Ceramic and aluminum alloy composite. 4,559,277, Cl. 428-627.000.
Ito, Toshio: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Ito, Yuji: *See*—
Murata, Toshinori; Ito, Yuji; and Kazumi, Masafumi, 4,559,560, Cl. 358-167.000.
Itoh, Ayao: *See*—
Aida, Satoshi; and Itoh, Ayao, 4,558,709, Cl. 128-719.000.
Itoh, Masataka; and Katoh, Shohichi, to Sharp Kabushiki Kaisha. Two-dimensional image reader. 4,559,564, Cl. 358-293.000.
Itoh, Tetsuroh, to Mitsubishi Denki Kabushiki Kaisha. Wire EDM for detecting discharge concentrations using inductance. 4,559,432, Cl. 219-69.00W.
Iverson, Peter B.; and Gambell, John A., to Imperial Plastics, Inc. Point of sales package for cassette tape cartridges. 4,558,782, Cl. 206-387.000.
Iwahara, Makoto: *See*—
Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, 4,559,642, Cl. 381-92.000.
Iwai, Masato: *See*—
Nakao, Sho; Kunichika, Kenji; Ohishi, Chikashi; Iwai, Masato; and Iwamoto, Kiyoshi, 4,559,288, Cl. 430-60.000.
Iwama, Toshiro: *See*—
Asada, Hiroshi; Kobayashi, Kohei; and Iwama, Toshiro, 4,559,143, Cl. 210-714.000.
Iwamoto, Kiyoshi: *See*—
Nakao, Sho; Kunichika, Kenji; Ohishi, Chikashi; Iwai, Masato; and Iwamoto, Kiyoshi, 4,559,288, Cl. 430-60.000.
Iwamura, Hiroyuki: *See*—
Yoshinaga, Shinya; and Iwamura, Hiroyuki, 4,558,571, Cl. 62-238.600.
Izawa, Shinichiro: *See*—
Inagaki, Takashi; Fujita, Yasumasa; and Izawa, Shinichiro, 4,558,667, Cl. 123-90.440.
Izawa, Toshihisa: *See*—
Kumazawa, Takahiro; Nakamura, Yoshihiro; and Izawa, Toshihisa, 4,558,695, Cl. 228-183.000.
Izumi, Eiki: *See*—
Watanabe, Hiroshi; and Izumi, Eiki, 4,558,593, Cl. 73-168.000.
J. S. Technology, Inc.: *See*—
Stasiek, Jan S.; and Deyhimy, Ira, 4,558,601, Cl. 73-862.230.
Jackovich, Melvin C.: *See*—
Spencer, William; and Jackovich, Melvin C., 4,559,486, Cl. 322-99.000.
Jackson, Andre J. Umbrella holder. 4,558,807, Cl. 224-251.000.
Jackson, Roy J., to Shell Oil Company. Flame retardent epoxy resin composition. 4,559,395, Cl. 528-102.000.
Jacobsen, Stephen C.: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,559,033, Cl. 604-49.000.
Jagenberg AG: *See*—
Sommer, Herbert; and Wohlfeil, Gerhard, 4,558,658, Cl. 118-411.000.
Jager, Gerhard: *See*—
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.
Jahnke, Frederick C.; Crouch, William B.; and Gulko, George M., to Texaco Inc. Means for synthesis gas generation with control of ratio of steam to dry gas. 4,559,061, Cl. 48-63.000.
Jaicks, John R. Animal proof storage container apparatus. 4,558,796, Cl. 220-1.00T.
Jalger Limited: *See*—
Hojnoski, David E., 4,558,639, Cl. 99-277.100.
Janerstal, Tommy; and Yngvesson, Sven H., to Partille Tool Aktiebolag. Adjustable clamp for holding objects securely in position. 4,558,853, Cl. 269-71.000.
Janiga, Eugene R., to Masonite Corporation. Method of bonding using a lignosulfonate-phenol-formaldehyde resin binder. 4,559,097, Cl. 156-335.000.
Jansen, Klaus: *See*—
Ulrich, Reinhard; and Jansen, Klaus, 4,558,950, Cl. 356-345.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Aotani, Seiji; and Kanayama, Hisanori, 4,559,303, Cl. 435-180.000.
Japax Incorporated: *See*—
Inoue, Kiyoshi; Shimizu, Akihiko; and Yabe, Jinzo, 4,558,977, Cl. 409-80.000.
Jeco Company Limited: *See*—
Takahashi, Akira; Matsui, Kenji; and Suzuki, Hajime, 4,559,461, Cl. 310-49.00R.
Jenneman, Gary E.: *See*—
McInerney, Michael J.; Jenneman, Gary E.; Knapp, Roy M.; and Menzie, Donald E., 4,558,739, Cl. 166-246.000.
Jensen, Donald M.: *See*—
Royse, Vicki L.; and Jensen, Donald M., 4,559,120, Cl. 204-182.800.
Jensen, Harold A. Apparatus and method for forming apertures in film materials. 4,559,199, Cl. 264-511.000.
Jeumont-Schneider Corporation: *See*—
Camus, Etienne, 4,559,460, Cl. 307-592.000.
Jezo, Maurice L.; and Lu, Ning H., to International Telephone and Telegraph Corporation. Arrangement to provide an accurate time-of-arrival indication for a received signal. 4,559,606, Cl. 364-728.000.
Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Hirano, Koki, 4,559,484, Cl. 318-443.000.
Jidosha Kiki Co. Ltd.: *See*—
Sakaguchi, Shozo; and Yanagi, Kunio, 4,558,798, Cl. 220-256.000.
Johannesburg Consolidated Investment Company Limited: *See*—
Muir, Colin W. A.; and Hendriks, Leonard P., 4,559,209, Cl. 423-30.000.
John, Willy; Klimaschka, Norbert; Wagner, Arno; and Meyer, Gunther, to Gebruder Netzsch Maschinenfabrik GmbH & Co. Agitator mill. 4,558,825, Cl. 241-171.000.
Johnson, Bruce V.; and Guile, Roy N., to United Technologies Corporation. Shear layer control in a free-vortex aerodynamic window. 4,559,628, Cl. 372-104.000.
Johnson, Joel C., to Electro Scientific Industries, Inc. Acousto-optic beam deflector. 4,558,926, Cl. 350-373.000.
Johnson Service Company: *See*—
Rudich, George, Jr.; and Troup, David L., 4,559,441, Cl. 219-364.000.
Johnston, Reed H., to New England Power Service Company. Method for communication utilizing multi-mode reception. 4,559,520, Cl. 340-310.00R.
Joiner, Ronald E., Jr., to Xerox Corporation. Adaptive prediction for binary encoded documents containing a mixture of text, line drawings and halftones. 4,559,563, Cl. 358-260.000.
Joker System Aktiebolag: *See*—
Jostler, Jan, 4,558,556, Cl. 53-459.000.
Jones, David J. Joint grouting tool. 4,558,481, Cl. 15-105.500.
Jones, William R., to Rolls-Royce Limited. Method of increasing the wettability of a surface by a molten metal. 4,559,246, Cl. 427-299.000.
Jorns, Peter; Meyer, Norbert; Rausch, Werner; Rothkegel, Josef; Luckhardt, Gunther; and Volling, Gudrun, to Parker Chemical Company. Process for phosphating metals. 4,559,087, Cl. 148-6.15Z.
Josephs, Richard M.: *See*—
Wang, Tsing-Chow; and Josephs, Richard M., 4,559,459, Cl. 307-462.000.
Jostler, Jan, to Joker System Aktiebolag. Belt having a succession of packaging blanks and method for filling the blanks. 4,558,556, Cl. 53-459.000.
Joyce, Patrick J., to University of Scranton. Method of administration of chemotherapy to tumors. 4,558,690, Cl. 128-1.00R.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brustle, Klaus, 4,558,485, Cl. 16-370.000.
Rock, Erich; and Brunner, Josef, 4,558,908, Cl. 308-3.800.
Julke, Elias; Kaiser, Tony; Osman, Maged A.; and Perkins, Roger, to BBC Brown, Boveri & Company, Limited. Zinc oxide varistor. 4,559,167, Cl. 252-518.000.
Jundt, Werner; Kosak, Wolfgang; and Werner, Peter, to Robert Bosch GmbH. Control device for incressing speed of actuation of an electromagnetic consumer, particularly in an internal combustion engine. 4,559,483, Cl. 318-301.000.
Junkosha Company Ltd.: *See*—
Suzuki, Hirosuke, 4,559,254, Cl. 428-131.000.
K/S Epoke: *See*—
Petersen, Jens, 4,558,824, Cl. 239-684.000.
Kabelmetal Electro Gesellschaft mit beschrankter Haftung: *See*—
Ziemek, Gerhard, 4,558,736, Cl. 165-183.000.
Kablitz, Carl: *See*—
Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,559,033, Cl. 604-49.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Tamura, Kazuhisa; Iida, Kazumi; and Koshimo, Masahiko, 4,559,024, Cl. 464-63.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Mikami, Yoshiharu, 4,558,774, Cl. 193-2.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ueda, Hiroshi; Matsumoto, Takeshi; and Hashimoto, Masami, 4,558,717, Cl. 137-596.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Takei, Katsumori; and Nakamura, Haruo, 4,559,161, Cl. 252-299.630.
Kaiser Aluminum & Chemical Corporation: *See*—
Baker, Bernard R., 4,559,114, Cl. 204-37.600.

Kaiser, Hans-Georg: *See*—
Nitschmann, Karl; Linke, Wilfried; Dietzsch, Gunter; Hartmann, Werner; Kaiser, Hans-Georg; Meyle, Werner; and Dolata, Hans, 4,558,621, Cl. 83-834.000.
Kaiser, Tony: *See*—
Julke, Elias; Kaiser, Tony; Osman, Maged A.; and Perkins, Roger, 4,559,167, Cl. 252-518.000.
Kaiya, Nobuo: *See*—
Sasaki, Shosaku; Kaiya, Nobuo; and Shirahata, Akihiko, 4,559,396, Cl. 528-15.000.
Kalvoda, Jaroslav: *See*—
Grob, Jurgen; and Kalvoda, Jaroslav, 4,559,332, Cl. 514-175.000.
Kamardin, Alexei M.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.
Kameoka, Takahito: *See*—
Goto, Moritaka; and Kameoka, Takahito, 4,558,913, Cl. 339-74.00R.
Kamiya, Shigeru: *See*—
Kojima, Akikazu; and Kamiya, Shigeru, 4,558,565, Cl. 60-286.000.
Kamochi, Atsumi: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,559,079, Cl. 71-92.000.
Kamono, Takashi; and Yamada, Hiromi, to AMP Incorporated. Electrical connector assembly. 4,558,917, Cl. 339-143.00R.
Kan, Kazutoshi; and Oizumi, Junichi, to Hitachi, Ltd. Spread spectrum system. 4,559,633, Cl. 375-1.000.
Kanatani, Fujio: *See*—
Uehara, Makoto; Sudo, Takeshi; and Kanatani, Fujio, 4,558,949, Cl. 356-152.000.
Kanayama, Hisanori: *See*—
Aotani, Seiji; and Kanayama, Hisanori, 4,559,303, Cl. 435-180.000.
Kanbara, Yoichi: *See*—
Nakashima, Hiroyuki; Tamura, Atuyoshi; Kanbara, Yoichi; and Fujii, Masaharu, 4,559,268, Cl. 428-397.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakashima, Hiroyuki; Tamura, Atuyoshi; Kanbara, Yoichi; and Fujii, Masaharu, 4,559,268, Cl. 428-397.000.
Kaplan, Jay; and Marchant, Ray, to Honeywell Information Systems Inc. Factory data collection terminal mounted to a vertical surface by a quick disconnect wall bracket. 4,558,839, Cl. 248-542.000.
Kaplanis, John N. Safety device for choker-collar. 4,558,663, Cl. 119-106.000.
Kapralis, Imants P.; and Krukle, Harry. Heat producing mask and method of use. 4,559,047, Cl. 604-291.000.
Karhola, Arvo K.: *See*—
Lehtinen, Jukka A.; Karhola, Arvo K.; and Griner, Walter H., 4,558,960, Cl. 384-373.000.
Kariu, Keiki: *See*—
Kirita, Yasuzo; Kawahashi, Masaru; Kariu, Keiki; Sunahara, Kimihisa; and Naito, Hidemune, 4,559,034, Cl. 604-52.000.
Kasai, Shunji; Akaike, Toshihiro; and Miyata, Teruo, to Koken Co., Ltd. Substratum for cell culture and a method for culturing and isolating cells using same. 4,559,304, Cl. 435-240.000.
Kasprzyk, Martin R.; and TenEyck, Monika O., to Kennecott Corporation. Composite refractory foams. 4,559,244, Cl. 427-227.000.
Kastner, Ralph E.: *See*—
Michel, Karl H.; and Kastner, Ralph E., 4,559,323, Cl. 514-9.000.
Kasuga, Takuzo; Ikenaga, Yukio; Yamawaki, Masami; and Tanimura, Keizo, to Polyplastics Company, Ltd. Polyacetal resin composition. 4,559,380, Cl. 524-317.000.
Katagi, Takashi: *See*—
Betsudan, Shinichi; Aoki, Katsuhiko; Sato, Shigeru; and Katagi, Takashi, 4,559,540, Cl. 343-761.000.
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, to Matsushita Electric Industrial Co., Ltd. Print element and printing apparatus using same. 4,558,964, Cl. 400-144.100.
Katano, Yasuo: *See*—
Matsumoto, Shuzo; Isayama, Takuro; Yamazaki, Hiroshi; and Katano, Yasuo, 4,559,544, Cl. 346-140.00R.
Kataoka, Hiroyuki; and Arai, Yoshio, to Fuji Xerox Co., Ltd. Image processing apparatus and method for recognizing only desired patterns. 4,559,644, Cl. 382-9.000.
Katayama, Yoshifumi: *See*—
Shiraki, Yasuhiro; Murayama, Yoshimasa; Katayama, Yoshifumi; and Maruyama, Eiichi, 4,559,547, Cl. 357-23.200.
Kato Iron Works, Ltd.: *See*—
Kato, Masa, 4,558,511, Cl. 29-598.000.
Kato, Masa, to Kato Iron Works, Ltd. Method of manufacture of a magnetic rotor core member for a rotating-field dynamoelectric machine. 4,558,511, Cl. 29-598.000.
Kato, Tadashi: *See*—
Ueda, Toshio; Kato, Tadashi; Mukai, Ryuichi; and Harada, Susumu, 4,559,391, Cl. 525-366.000.
Kato, Yuuichi: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Katoh, Shohichi: *See*—
Itoh, Masataka; and Katoh, Shohichi, 4,559,564, Cl. 358-293.000.
Katsui, Yoshihiro: *See*—
Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, 4,559,249, Cl. 428-36.000.
Katsuki, Kosuke; and Murakami, Yukihiro, to Toray Industries, Inc. Apparatus for producing oxidized filaments. 4,559,010, Cl. 432-59.000.
Katsuragi, Shigeru; Hakkaku, Kunio; and Ogawa, Mutsuo, to Ricoh Company, Ltd. Thermosensitive recording system. 4,559,565, Cl. 358-296.000.
Katz, Richard: *See*—
Reiss, John R.; and Katz, Richard, 4,558,907, Cl. 303-74.000.
Kaufman, Geraldine M.: *See*—
Ash, Stephen R.; and Kaufman, Geraldine M., 4,559,039, Cl. 604-175.000.
Kawabata, Fumio: *See*—
Kuwahata, Toshikatsu; Kawabata, Fumio; and Kurosawa, Genzo, 4,559,584, Cl. 362-86.000.
Kawabata, Kohji: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,559,334, Cl. 514-202.000.
Kawahashi, Masaru: *See*—
Kirita, Yasuzo; Kawahashi, Masaru; Kariu, Keiki; Sunahara, Kimihisa; and Naito, Hidemune, 4,559,034, Cl. 604-52.000.
Kawai, Akio: *See*—
Ishikawa, Yasuki; Sone, Masazumi; and Kawai, Akio, 4,558,685, Cl. 123-620.000.
Kawai, Taiyo: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Kawajiri, Kazuhiro: *See*—
Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Kido, Keishiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,559,289, Cl. 430-66.000.
Kawamoto, Kazuyuki: *See*—
Tada, Tetsuya; Kawamoto, Kazuyuki; and Yamada, Akihiko, 4,558,821, Cl. 239-333.000.
Kawano, Akira: *See*—
Iemura, Shigeru; and Kawano, Akira, 4,559,545, Cl. 346-155.000.
Kawasumi Laboratories, Inc.: *See*—
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Aoki, Shigetada; Usui, Masahiko; and Kitano, Kojuro, 4,558,572, Cl. 62-378.000.
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Gants, Wilbur L.; Kline, William T.; and Sneddon, Jonathan T., 4,559,005, Cl. 425-363.000.
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Pufal, Rolf H., 4,558,871, Cl. 277-84.000.
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Overman, David L.; and Konick, William L., 4,559,419, Cl. 200-5.00R.

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Chen, Wen-Sherng; and Soucie, William G., 4,559,233, Cl. 426-104.000.

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M.D.S. Furnace Services Limited: *See*—
Mosley, David R., 4,558,791, Cl. 212-266.000.
Ma, Bing-Fong, to Advanced Micro Devices, Inc. Temperature tracking and supply voltage independent line driver for ECL circuits. 4,559,458, Cl. 307-455.000.
Maassen, Wilhelm: *See*—
Aretz, Ulrich; Knors, Herbert; Maassen, Wilhelm; Reiners, Franz-Josef; and Tholen, Leo, 4,558,829, Cl. 242-35.50A.
Machida, Yukihiko: *See*—
Akutagawa, Tooru; and Machida, Yukihiko, 4,559,501, Cl. 330-293.000.
Maciejko, James J.: *See*—
Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,559,326, Cl. 514-23.000.
Mackie, Ronald D., to Nutek, Incorporated. Electronic ignition system for internal combustion engines. 4,558,673, Cl. 123-416.000.
Macklin, Ian S.: *See*—
Leigh, Malcolm H.; Deiner, Hans; Philpott, George C.; Macklin, Ian S.; and McDonald, Alan, 4,559,056, Cl. 8-115.640.
MacLeod, Roderick B.; and Mandeville, Paul J., to Taft-Peirce Supfina Machine Company, Inc. Centerless honing machines having automatic size control. 4,558,537, Cl. 51-66.000.
Maeda, Chiaki: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,559,179, Cl. 260-456.00F.
Maes, Pascal, to Clecim. System for measuring the arc voltage in an electric furnace. 4,559,630, Cl. 373-93.000.
Magata, Yasuhiro: *See*—
Arano, Yasushi; Magata, Yasuhiro; and Yokoyama, Akira, 4,559,221, Cl. 424-1.100.
Magis Farmaceutici S.R.L.: *See*—
Puricelli, Laura, 4,559,360, Cl. 514-548.000.
Maida, Osamu: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,558,935, Cl. 354-21.000.
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Achim; and Topfl, Werner, to Ciba-Geigy Corporation. Herbicidal and growth regulator phosphorus-containing N-phenylsulfonyl-N'-pyrimidinylureas and N-phenylsulfonyl-N'-triazinylureas. 4,559,078, Cl. 71-87.000.
Maier, Peter; and Arnold, Gunther. Table made up of a number of parts, more especially a bench. 4,558,649, Cl. 108-159.000.
Maitland, Arthur: *See*—
Donaldson, Timothy P.; Pirrie, Colin A.; and Maitland, Arthur, 4,559,466, Cl. 313-15.000.
Malchenok, Vladimir O.: *See*—
Kuznetsov, Oleg L.; Maxutov, Rafkhat A.; Malchenok, Vladimir O.; Mordukhaev, Khanuko M.; Ostrovsky, Anatoly P.; Rubtsov, Adolf E.; Simkin, Ernst M.; and Sokolov, Alexei V., 4,558,737, Cl. 166-60.000.
Malinowski, Peter: *See*—
Divisek, Jiri; and Malinowski, Peter, 4,559,124, Cl. 204-295.000.
Malmquist, Alfred B.: *See*—
Freshwater, John G.; and Malmquist, Alfred B., 4,559,267, Cl. 428-352.000.
Malmstrom, Herbert A.; and Roddiger, Henry A., to Engineered Air Systems, Inc. Protective shelter flow control apparatus. 4,558,636, Cl. 98-39.100.
Maltz, Javier E., to Etablissement Texcontor. Non-absorbable compounds of mucolytic activity, the process for their preparation, and therapeutic compositions which contain them as active principle. 4,559,322, Cl. 514-8.000.
Mama, Fumio: *See*—
Hashimoto, Mitsuo; Watanabe, Yasuo; Mama, Fumio; and Odan, Akinori, 4,559,007, Cl. 431-4.000.
Manabe, Sugio: *See*—
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, 4,558,946, Cl. 356-73.000.
Manchester, Donald F.: *See*—
Zajic, James E.; Hill, Martha A.; Manchester, Donald F.; and Muzika, Karel, 4,559,305, Cl. 435-243.000.
Mandeville, Paul J.: *See*—
MacLeod, Roderick B.; and Mandeville, Paul J., 4,558,537, Cl. 51-66.000.
Manfredi, Oscar: *See*—
Rueff, Herbert; and Manfredi, Oscar, 4,558,555, Cl. 53-493.000.
Manheimer, Wallace; and Levush, Baruch, to United States of America, Navy. Quasi-optical harmonic gyrotron and gyroklystron. 4,559,475, Cl. 315-4.000.
Manna, Robert E.: *See*—
Erwin, Timothy R.; and Manna, Robert E., 4,559,444, Cl. 235-101.000.
Mannesmann Aktiengesellschaft: *See*—
Dittie, Bernhard, 4,558,987, Cl. 415-162.000.
Grutzner, Gunther, 4,559,090, Cl. 148-12.00E.
Mannion, Thomas M.: *See*—
Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., 4,558,874, Cl. 277-112.000.
Manteufel, Dale A., to Ingersoll Equipment Co., Inc. Tractor-mounted implement hitch arrangement. 4,558,881, Cl. 280-460.00A.
Manzoni, Stephane, to Societe Manzoni-Bouchot. Device for mounting a rearview mirror casing on a support member. 4,558,840, Cl. 248-549.000.
Marathon Oil Company: *See*—
Luetzelschwab, Wayne E., 4,559,202, Cl. 422-134.000.
Sweet, Welby C., 4,559,070, Cl. 62-17.000.
Marchais, Jean; and Netter, Michel, to SMAC Acieroid. Insulating and fluidtight roof covering. 4,558,550, Cl. 52-309.700.
Marchant, David J., to Ti Russell Hobbs Limited. Apparatus for making hot drinks. 4,558,640, Cl. 99-307.000.
Marchant, Ray: *See*—
Kaplan, Jay; and Marchant, Ray, 4,558,839, Cl. 248-542.000.
Marco Seattle, Inc.: *See*—
Roach, Stewart W., 4,558,990, Cl. 417-54.000.
Margison, Elwood R., to United Conveyor Corporation. Fluent solid material handling system. 4,558,805, Cl. 222-133.000.
Marino, John A.; Strohl, Roderick G., Jr.; and Yost, Robert B., to Hauck Manufacturing Company. Aggregate dryer burner. 4,559,009, Cl. 431-184.000.
Mark, Harold W.: *See*—
Baldwin, Bernard A.; and Mark, Harold W., 4,559,153, Cl. 252-48.600.
Mark, Hermann. Vestibular stimulation method. 4,558,703, Cl. 128-421.000.
Markowitz, Raymond S.; Even-Or, Baruch; and Bohlman, Walter, to American Electronic Laboratories, Inc. Spiral antenna deformed to receive another antenna. 4,559,539, Cl. 343-725.000.
Marmon Group, Inc., The: *See*—
Theilig, Arthur W.; and Poplis, John, 4,558,661, Cl. 119-43.000.
Maronne, Pierre: *See*—
Beaudoin, Paul; and Maronne, Pierre, 4,558,588, Cl. 73-54.000.
Maroti, Endre S.: *See*—
Reardon, Richard J.; Maroti, Endre S.; Roy, Colin; and Lindsay, John S., 4,558,576, Cl. 72-9.000.
Marschner, Friedemann: *See*—
Hiller, Heinz; Supp, Emil; Marschner, Friedemann; Kupfer, Hans; and Weidemann, Lutz, 4,559,207, Cl. 422-197.000.
Martens, John A.; and Williams, Brian H., to Minnesota Mining and Manufacturing Company. Processable radiation curable poly(vinyl chloride) resin compositions. 4,559,382, Cl. 524-535.000.
Martin, Joel L., to Phillips Petroleum Company. Olefin polymerization. 4,559,317, Cl. 502-104.000.
Martin, Joel L.: *See*—
Smith, Paul D.; and Martin, Joel L., 4,559,318, Cl. 502-110.000.
Martin, Michel J. L.: *See*—
Mens, Jacques M. N.; Barnoin, Pierre; and Martin, Michel J. L., 4,558,837, Cl. 244-108.000.

Martinek, John J., to Evans Products Company. Hammer for automobile shredding mills. 4,558,826, Cl. 241-189.00R.
Martinek, Thomas W., to Teepak, Inc. Size control system for automatic sausage stuffing. 4,558,488, Cl. 17-41.000.
Martinez, Angel C., to Borg-Warner Corporation. Mechanical seal assembly. 4,558,870, Cl. 277-15.000.
Martinez, Oscar G.: *See—*
Tapia, Graciano J.; and Martinez, Oscar G., 4,559,381, Cl. 524-405.000.
Marton, Miska. Stick-on abrasive disc. 4,558,542, Cl. 51-358.000.
Martorano, Joseph A.: *See—*
Watkins, Randy W.; Bell, Robert J.; Martorano, Joseph A.; and Essinger, Walter F., 4,559,535, Cl. 340-793.000.
Martucci, James P.: *See—*
Barreras, Francisco J.; and Martucci, James P., 4,558,702, Cl. 128-419.0PG.
Maruichi, Takanori; and Hagita, Shoji, to Sony Corporation. Apparatus for recording and/or reproducing video and audio signals. 4,559,567, Cl. 360-10.300.
Maruko, Morihisa: *See—*
Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Morihisa, 4,559,060, Cl. 44-23.000.
Maruyama, Eiichi: *See—*
Shiraki, Yasuhiro; Murayama, Yoshimasa; Katayama, Yoshifumi; and Maruyama, Eiichi, 4,559,547, Cl. 357-23.200.
Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Electrochemical device. 4,559,126, Cl. 204-425.000.
Mason, Reginald E. Roof ridge ventilator improvements. 4,558,637, Cl. 98-42.210.
Masonite Corporation: *See—*
Janiga, Eugene R., 4,559,097, Cl. 156-335.000.
Masugi, Takashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,559,334, Cl. 514-202.000.
Masuhara, Toshiaki: *See—*
Koike, Norio; Ohba, Shinya; and Masuhara, Toshiaki, 4,559,550, Cl. 357-24.000.
Matesa, Joseph M.: *See—*
Kunkle, Gerald E.; and Matesa, Joseph M., 4,559,071, Cl. 65-135.000.
Matier, William L., to American Hospital Supply Corporation. Method for treating glaucoma by the topical administration of selectively metabolized beta-blocking agents. 4,559,359, Cl. 514-522.000.
Matsuda, Shinpei: *See—*
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Matsufuji, Yohji: *See—*
Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 4,559,543, Cl. 346-140.00R.
Matsui, Hiroyuki: *See—*
Morikawa, Yoshitaka; and Matsui, Hiroyuki, 4,558,473, Cl. 4-420.200.
Matsui, Kenji: *See—*
Takahashi, Akira; Matsui, Kenji; and Suzuki, Hajime, 4,559,461, Cl. 310-49.00R.
Matsumoto, Fumio. Image receiving transparent base film. 4,559,256, Cl. 428-141.000.
Matsumoto, Hiroshi; Ishikawa, Yuji; and Nakamine, Chosin, to Tokyo Shibaura Denki Kabushiki Kaisha. Display device for a copying machine. 4,559,519, Cl. 340-286.00M.
Matsumoto, Shuzo; Isayama, Takuro; Yamazaki, Hiroshi; and Katano, Yasuo, to Ricoh Company, Ltd. Multi-nozzle head for ink on-demand type ink jet printer. 4,559,544, Cl. 346-140.00R.
Matsumoto, Takeshi: *See—*
Ueda, Hiroshi; Matsumoto, Takeshi; and Hashimoto, Masami, 4,558,717, Cl. 137-596.000.
Matsunaga, Kenichi: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.
Matsuno, Kenji; and Kuse, Kazuma, to Toyo Seikan Kaisha Limited. Apparatus for producing welded metallic can bodies. 4,559,431, Cl. 219-64.000.
Matsuo, Ichiro: *See—*
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,558,480, Cl. 15-77.000.
Matsuo, Kazumasa: *See—*
Nakada, Akio; and Matsuo, Kazumasa, 4,558,706, Cl. 128-660.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,559,279, Cl. 428-632.000.
Hori, Michimasa; Hirano, Hideo; Kojima, Yoshinori; and Yuda, Jiro, 4,558,993, Cl. 417-283.000.
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, 4,558,964, Cl. 400-144.100.
Minakuchi, Hiroshi, 4,559,488, Cl. 323-281.000.
Mori, Yoshihiro; Yamamoto, Osamu; and Yamamoto, Kazumasa, 4,558,757, Cl. 178-18.000.
Morikawa, Yoshitaka; and Matsui, Hiroyuki, 4,558,473, Cl. 4-420.200.
Matsushita Electric Works, Ltd.: *See—*
Yamamoto, Shigeo; Tanimizu, Makoto; Shirakawa, Kenzo; and Wataya, Hideji, 4,559,456, Cl. 307-66.000.
Matsushita Graphic Communication Systems, Inc.: *See—*
Iemura, Shigeru; and Kawano, Akira, 4,559,545, Cl. 346-155.000.
Matsuzaka, Hiroko: *See—*
Ichikawa, Akira; and Matsuzaka, Hiroko, 4,559,604, Cl. 364-513.500.
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, to BBC Brown, Boveri & Company, Limited. Perforated plate for evening out the velocity distribution. 4,559,275, Cl. 428-596.000.
Mattel, Inc.: *See—*
Hippely, Keith A., 4,558,867, Cl. 273-412.000.
Wittenberg, Mark S.; and Wulff, Virgil W., 4,559,021, Cl. 446-352.000.
Matthew, Michael W.: *See—*
Friedman, Lewis; Buehler, Robert J.; Matthew, Michael W.; and Ledbetter, Myron, 4,559,096, Cl. 156-272.200.
Mattson, Andrew P.: *See—*
Robinson, Thomas P.; Killman, Don M.; Mattson, Andrew P.; and Hudson, James E., Jr., 4,559,044, Cl. 604-246.000.
Mauser-Werke Oberndorf GmbH: *See—*
Hoffmann, Dietrich; and Gotz, Udo, 4,558,646, Cl. 102-527.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Derfler, Heinrich; Perchermeier, Jurgen; and Spitzer, Hermann, 4,559,281, Cl. 428-687.000.
Maxner, Richard B.: *See—*
Freeman, Gary T.; Maxner, Richard B.; and Nash, Thomas F., 4,558,983, Cl. 414-331.000.
Maxutov, Rafkhat A.: *See—*
Kuznetsov, Oleg L.; Maxutov, Rafkhat A.; Malchenok, Vladimir O.; Mordukhaev, Khanuko M.; Ostrovsky, Anatoly P.; Rubtsov, Adolf E.; Simkin, Ernst M.; and Sokolov, Alexei V., 4,558,737, Cl. 166-60.000.
May, Josephine B.: *See—*
Hurst, Jim; and May, Josephine B., 4,559,348, Cl. 514-303.000.
Mayekawa Mfg. Co., Ltd.: *See—*
Aoki, Shigetada; Usui, Masahiko; and Kitano, Kojuro, 4,558,572, Cl. 62-378.000.
Mayer, Edward F., to Ricoh Company Ltd. Electrophotographic copying apparatus including electrically biased transfer station and method. 4,559,509, Cl. 355-3.0TR.
Mazanec, Terry J.; and Frye, John G., Jr., to Standard Oil Company, The. Copper-zirconium-manganese-containing catalysts. 4,559,316, Cl. 502-73.000.
Mazuer, Jean: *See—*
Chaussy, Jacques; Genicon, Jean-Louis; Mazuer, Jean; Pilon, Jean; and Sulpice, Andre , 4,558,512, Cl. 29-599.000.
McAnallan, John: *See—*
Engelson, Steven N.; and McAnallan, John, 4,559,588, Cl. 362-196.000.
McAneney, T. Brian; Loutfy, Rafik O.; Ong, Beng S.; and Popovic, Zoran D., to Xerox Corporation. Stabilized photoresponsive devices containing electron transporting layers. 4,559,287, Cl. 430-59.000.
McBrearty, Michael; Negin, Michael; Weilerstein, I. Marvin; and Zielenski, Albert J., to Kulicke and Soffa Industries Inc. Apparatus for detecting missing wires. 4,558,596, Cl. 73-588.000.
McCann, Artie. Combustion gas heat recovery apparatus. 4,558,689, Cl. 126-117.000.
McConchie, Garnet E.: *See—*
Swearingen, Loren L.; Heinsohn, Alfred W.; Snook, Craig W.; Embrey, Wallace E.; and McConchie, Garnet E., 4,559,110, Cl. 203-37.000.
McDaniel, Max P., to Phillips Petroleum Company. Olefin polymerization using activated chromium catalyst treated with tertiary alcohol. 4,559,394, Cl. 526-106.000.
McDermid, Iain S.; and Pacala, Thomas J., to California Institute of Technology. Mirror-grating tuning arrangement for high resolution lasers. 4,559,500, Cl. 330-4.300.
McDermott, Wayne T.: *See—*
Ying, David H. S.; McDermott, Wayne T.; and Givens, Edwin N., 4,558,651, Cl. 110-347.000.
McDonald, Alan: *See—*
Leigh, Malcolm H.; Deiner, Hans; Philpott, George C.; Macklin, Ian S.; and McDonald, Alan, 4,559,056, Cl. 8-115.640.
McDonald, Robert. Automatic valve closer to prevent tampering with a thermostatic controlled radiator. 4,558,819, Cl. 236-42.000.
McGean-Rohco, Inc.: *See—*
Beach, Sidney C.; and Loar, Gary W., 4,559,269, Cl. 428-403.000.
McGill, Eugene C.; and Rawlings, Robert L., to McGill Incorporated. Purging process. 4,559,006, Cl. 431-3.000.
McGill Incorporated: *See—*
McGill, Eugene C.; and Rawlings, Robert L., 4,559,006, Cl. 431-3.000.
McInerney, Michael J.; Jenneman, Gary E.; Knapp, Roy M.; and Menzie, Donald E., to University of Oklahoma, The Board of Regents for the. Situ microbial plugging process for subterranean formations. 4,558,739, Cl. 166-246.000.
McKibben, Charlton K.: *See—*
Treharne, Richard W.; McKibben, Charlton K.; and Moles, Donald R., 4,559,206, Cl. 422-186.240.
McKinlay, James K.: *See—*
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,559,280, Cl. 428-633.000.
McNamara, Paul E.: *See—*
Neustadt, Bernard R.; Andrews, David R.; and McNamara, Paul E., 4,559,340, Cl. 514-222.000.
McVey, Charles I., to General Electric Company. Electrode structure for high pressure sodium vapor lamps. 4,559,473, Cl. 313-630.000.
Mead Corporation, The: *See—*
Wood, Prentice J., 4,558,816, Cl. 229-52.00B.

Mecheri, Salah: *See*—
David, Bernard; Peltre, Gabriel; and Mecheri, Salah, 4,559,230, Cl. 424-91.000.

Medwedeff, Marion C. Handgrip exercising, computer game controller. 4,558,864, Cl. 273-148.00B.

Meickl, Gerhard, to Streif AG. Beam connector. 4,558,968, Cl. 403-174.000.

Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, to Ciba Geigy Corporation. Process for the deposition of metals on semiconductor powders. 4,559,237, Cl. 427-53.100.

Meike, Klaus, to Schaefer Werke GmbH. Heat exchanger having a metal baffle plate secured to a steel member. 4,558,735, Cl. 165-131.000.

Meiller, Hermann, to Messrs. Willibald Grammer. Travel seat. 4,558,902, Cl. 297-284.000.

Meinig, Manfred. Apparatus for flanging ventilation duct walls. 4,558,582, Cl. 72-381.000.

Meinlschmidt, Helmut, to SKF Kugellagerfabriken GmbH. Snap ring. 4,558,962, Cl. 384-570.000.

Melamine Chemicals, Inc.: *See*—
Freepons, Donald E., 4,559,075, Cl. 71-28.000.

Melfi, Nicholas W., to Concrete Pipe & Products Corp. Noise barrier. 4,558,850, Cl. 256-24.000.

Memorial Sloan Kettering Cancer Center: *See*—
Evenson, Donald P.; and Darzynkiewicz, Zbigniew, 4,559,309, Cl. 436-63.000.

Mendenhall, Harold P. Mechanical fruit picker. 4,558,561, Cl. 56-328.00R.

Menin, Jacques: *See*—
Bigg, Dennis; and Menin, Jacques, 4,559,356, Cl. 514-401.000.

Mens, Jacques M. N.; Barnoin, Pierre; and Martin, Michel J. L., to Societe Nationale Industrielle et Aerospatiale. Skid landing gear provided with components having a device for absorbing energy by plastic deformation and/or for limiting stress, and components of this type. 4,558,837, Cl. 244-108.000.

Menzie, Donald E.: *See*—
McInerney, Michael J.; Jenneman, Gary E.; Knapp, Roy M.; and Menzie, Donald E., 4,558,739, Cl. 166-246.000.

Merck & Co., Inc.: *See*—
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,338, Cl. 514-219.000.
Bock, Mark G.; Freidinger, Roger M.; and Evans, Ben E., 4,559,339, Cl. 514-219.000.

Merriam, Charles N.: *See*—
Kopf, Peter W.; and Merriam, Charles N., 4,559,247, Cl. 427-386.000.

Merrie, Kenneth: *See*—
Hunter, George S.; Walker, Brian; and Merrie, Kenneth, 4,559,066, Cl. 55-274.000.

Messrs. Willibald Grammer: *See*—
Meiller, Hermann, 4,558,902, Cl. 297-284.000.

Metal Box p.l.c.: *See*—
Dick, David A.; and Staines, Glyn, 4,559,197, Cl. 264-249.000.

Metal Box Public Limited Company: *See*—
Oakley, John R., 4,559,092, Cl. 156-69.000.

Metal Closures Limited: *See*—
Herbert, James F., 4,558,554, Cl. 53-331.500.

Metallgesellschaft AG: *See*—
Hiller, Heinz; Supp, Emil; Marschner, Friedemann; Kupfer, Hans; and Weidemann, Lutz, 4,559,207, Cl. 422-197.000.

Metev, Georgi M.: *See*—
Petkov, Georgi K.; Botev, Botyo P.; Naydenov, Ivan H.; Metev, Georgi M.; and Petrov, Yakim N., 4,558,579, Cl. 72-56.000.

Metzger, Karl G.: *See*—
Petersen, Uwe; Grohe, Klaus; Kuhle, Engelbert; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,341, Cl. 514-254.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,342, Cl. 514-254.000.

Metzger, Robert A.: *See*—
Allen, Frederick G.; Streit, Dwight C.; and Metzger, Robert A., 4,559,091, Cl. 148-174.000.

Meyer, Gunther: *See*—
John, Willy; Klimaschka, Norbert; Wagner, Arno; and Meyer, Gunther, 4,558,825, Cl. 241-171.000.

Meyer, Jerry R.: *See*—
Hoffman, Craig A.; Meyer, Jerry R.; and Bartoli, Filbert, 4,558,923, Cl. 350-354.000.

Meyer, Norbert: *See*—
Jorns, Peter; Meyer, Norbert; Rausch, Werner; Rothkegel, Josef; Luckhardt, Gunther; and Volling, Gudrun, 4,559,087, Cl. 148-6.15Z.

Meyer, Willy: *See*—
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Achim; and Topfl, Werner, 4,559,078, Cl. 71-87.000.

Meyle, Werner: *See*—
Nitschmann, Karl; Linke, Wilfried; Dietzsch, Gunter; Hartmann, Werner; Kaiser, Hans-Georg; Meyle, Werner; and Dolata, Hans, 4,558,621, Cl. 83-834.000.

Mezger, Sepp: *See*—
Nieuwkamp, Wolfgang; and Mezger, Sepp, 4,558,822, Cl. 239-403.000.

Miale, Joseph N., to Mobil Oil Corporation. Reactivation of steam-deactivated catalysts. 4,559,131, Cl. 208-111.000.

Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,559,315, Cl. 502-71.000.

Michel, Karl H.; and Kastner, Ralph E., to Eli Lilly and Company. A41030 Antibiotics. 4,559,323, Cl. 514-9.000.

Midwest Automation, Inc.: *See*—
Rohrbach, Walter, 4,558,657, Cl. 118-70.000.

Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Method and apparatus for collecting weighted articles discharged from combinatorial weighing system. 4,558,774, Cl. 193-2.00R.

Mikiya, Toshio: *See*—
Shoji, Michihiro; and Mikiya, Toshio, 4,559,577, Cl. 361-31.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Seto, Toshiaki; Yamamoto, Hideo; and Kobayashi, Yoshiji, 4,559,185, Cl. 261-41.00D.

Mikuteit, Axel, to Koh-I-Noor Rapidograph, Inc. Writing instrument with sealing cap. 4,558,966, Cl. 401-213.000.

Miles Laboratories, Inc.: *See*—
Hemmes, Paul R., 4,558,589, Cl. 73-64.100.

Miller Dehydrator International, Inc.: *See*—
Miller, John T., 4,559,235, Cl. 426-636.000.

Miller, James R.: *See*—
Kovacevic, Steven; Fayerman, Jeffrey T.; Miller, James R.; and Richardson, Mark A., 4,559,300, Cl. 435-68.000.

Miller, Jeffrey T.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Process for reacting carbon monoxide and water. 4,559,363, Cl. 518-711.000.

Miller, John T., to Miller Dehydrator International, Inc. Low temperature dehydrated alfalfa product and method and apparatus for processing same. 4,559,235, Cl. 426-636.000.

Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Integrated precision reference source. 4,559,488, Cl. 323-281.000.

Minato, Hideo; Fujisaki, Tadashi; Shimizu, Kazufusa; and Koyanagi, Yoshiharu, to Niigata Engineering Co., Ltd. Method of composting excretions from domestic animals. 4,559,073, Cl. 71-9.000.

Minemet Rechreche: *See*—
Leroux, Yves, 4,559,181, Cl. 260-502.40A.

Minner, Willy; Spies, Heinz-Hermann; and Domland, Christoph, to Telefunken electronic GmbH. Electronic ignition system for gasoline internal combustion engines. 4,558,675, Cl. 123-427.000.

Minnesota Mining and Manufacturing Company: *See*—
Ellis, Arthur B.; and Carpenter, Michael K., 4,559,116, Cl. 204-129.300.
Hanson, Gary R.; and Rabuse, George R., 4,558,888, Cl. 281-23.000.
Martens, John A.; and Williams, Brian H., 4,559,382, Cl. 524-535.000.

Minolta Camera Kabushiki Kaisha: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.

Minshall, Michael; Park, Brian; Etchegoyen, Carlos; and Babrovniczky, Bert, to Spacemaker Limited. Stove. 4,558,687, Cl. 126-59.000.

Miranti, Joseph P., Jr.; Foley, Mark P.; Hollaway, Gerald C.; Oliver, Larry R.; Standley, Paul M.; and Lewis, James A., to Dayco Corporation. Endless power transmission V-belt constructions. 4,559,029, Cl. 474-251.000.

Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I. Microswitch. 4,559,422, Cl. 200-67.00D.

Miroshnichenko, Sergei V.: *See*—
Trishevsky, Igor S.; Patseka, Ivan E.; Temnikov, Eduard M.; Borisenko, Alexandr G.; Doktorov, Mark E.; Kheifets, Grigory R.; Lanko, Vladimir V.; and Miroshnichenko, Sergei V., 4,558,577, Cl. 72-12.000.

Mirviss, Stanley B.: *See*—
Giolito, Silvio L.; and Mirviss, Stanley B., 4,559,184, Cl. 260-974.000.

Misasa, Mitsugu; and Hirayama, Ryoichi, to Idemitsu Petrochemical Co., Ltd. Laminated materials for thermoforming into food packaging. 4,559,266, Cl. 428-341.000.

Mischenko, Vitaly N.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Mita, Tsunemasa, to Fuji Xerox Co., Ltd. Thermal printing head. 4,559,542, Cl. 346-76.0PH.

Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, to Figgie International Inc. Shock attenuation system. 4,558,470, Cl. 2-414.000.

Mitchell, Terry L., to Quest Product Development, Ltd. Storage unit module. 4,558,797, Cl. 220-84.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Aramaki, Jun; and Shinkai, Masaru, 4,559,433, Cl. 219-69.00W.
Betsudan, Shinichi; Aoki, Katsuhiko; Sato, Shigeru; and Katagi, Takashi, 4,559,540, Cl. 343-761.000.
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.
Hayakawa, Yoshitaka, 4,559,430, Cl. 219-61.000.
Itoh, Tetsuroh, 4,559,432, Cl. 219-69.00W.
Murakami, Katsuo; Yamazaki, Hitoshi; Tanaka, Norihiko; and Ito, Hiroshi, 4,559,470, Cl. 313-487.000.

Nakagawa, Tsutomu, 4,559,551, Cl. 357-38.000.
Ogawa, Hitoshi, 4,558,999, Cl. 418-173.000.
Okuda, Hiroshi, 4,558,683, Cl. 123-599.000.
Takeshita, Shigeki, 4,559,494, Cl. 324-103.00R.
Tanaka, Toshinori, 4,559,455, Cl. 290-38.00R.
Yabunaka, Kiyoshi, 4,558,668, Cl. 123-195.00A.
Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, 4,559,423, Cl. 200-144.00R.

Mitsubishi Gas Chemical Co., Inc.: *See*—
Nishimura, Toshiaki; and Kurokawa, Masahiro, 4,559,408, Cl. 564-2.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,558,612, Cl. 74-844.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Hoshino, Yuji; Endou, Hajime; and Suda, Kazuyoshi, 4,558,568, Cl. 60-641.500.

Mitsui Kensetsu Kabushiki Kaisha: *See*—
Takamiya, Shigeo; and Furuta, Toshio, 4,558,906, Cl. 299-31.000.

Mitsui Mining and Smelting Company, Ltd.: *See*—
Yamasaki, Syuichi; Yamaguchi, Hiroshi; and Taniguchi, Yousuke, 4,559,200, Cl. 420-492.000.

Mitsuo, Hirofumi; Watanabe, Shojiro; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Method of preparing color developer sheets. 4,559,242, Cl. 427-150.000.

Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, to Victor Company of Japan, Limited. Phased-array sound pickup apparatus. 4,559,642, Cl. 381-92.000.

Miyake, Atsushi: *See*—
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,558,480, Cl. 15-77.000.

Miyake, Satoru: *See*—
Morinaga, Hiroshi; Miyake, Satoru; and Sato, Terumi, 4,559,166, Cl. 252-512.000.

Miyamae, Ryuichi; and Yasuda, Haruo, to Sharp Kabushiki Kaisha. Electronic sphygmomanometer with voice synthesizer. 4,558,707, Cl. 128-683.000.

Miyasaka, Kingo: *See*—
Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, 4,559,249, Cl. 428-36.000.
Sumiyoshi, Kikuo; and Miyasaka, Kingo, 4,559,248, Cl. 428-36.000.

Miyata, Teruo: *See*—
Kasai, Shunji; Akaike, Toshihiro; and Miyata, Teruo, 4,559,304, Cl. 435-240.000.

Mobil Oil Corporation: *See*—
Agrawal, Anil K.; Saunders, Stephen W.; and Weckesser, George J., 4,559,204, Cl. 423-167.000.
Blair, Ron B., 4,559,620, Cl. 367-78.000.
Chang, Clarence D.; and Miale, Joseph N., 4,559,315, Cl. 502-71.000.
Kuhl, Gunter H., 4,559,213, Cl. 423-329.000.
Miale, Joseph N., 4,559,131, Cl. 208-111.000.
Shihabi, David S., 4,559,314, Cl. 502-71.000.

Mock, Elmar; and Muller, Jacques, to ETA S.A., Fabriques d'Ebauches. Plastic watch casing with plastic crystal and process for joining the crystal to the casing. 4,558,957, Cl. 368-294.000.

Moers, John W.: *See*—
Horres, Russell; and Moers, John W., 4,559,040, Cl. 604-153.000.

Moles, Donald R.: *See*—
Treharne, Richard W.; McKibben, Charlton K.; and Moles, Donald R., 4,559,206, Cl. 422-186.240.

Molison, Robert E., to Elsner Engineering Works, Inc. Carousel type dispenser. 4,558,802, Cl. 221-11.000.

Moller, Craig A., to Abar Ipsen Industries. Heat treating furnace with graphite heating elements. 4,559,631, Cl. 373-130.000.

Molloy, James J.: *See*—
Applegate, Steven L.; Molloy, James J.; and Wilbur, Clayton V., 4,558,963, Cl. 400-120.000.

Mondaine Watch Ltd.: *See*—
Bettschen, Josef, 4,558,956, Cl. 368-291.000.

Mondini, Anthony J.: *See*—
Herstein, Barry S.; and Mondini, Anthony J., 4,559,022, Cl. 446-438.000.

Monsanto Company: *See*—
Wu, Wan C., 4,559,386, Cl. 525-71.000.

Montabert, Roger, to Montabert S.A. Muffler for a pneumatic hammer. 4,558,763, Cl. 181-230.000.

Montabert S.A.: *See*—
Montabert, Roger, 4,558,763, Cl. 181-230.000.

Mooij, Joop N.: *See*—
Bus, Isaak; and Mooij, Joop N., 4,559,113, Cl. 204-15.000.

Mookerjee, Bhaskar, to Caterpillar Tractor Co. Exhaust gas and blow-by recirculation system for an internal combustion engine. 4,558,681, Cl. 123-568.000.

Moore, Jean-Pierre; Winand, Rene ; Weymeersch, Alain; and Renard, Lucien, to "Cockerill-Sambre" . Device for electrolytically depositing a lining metal layer over a metal strip. 4,559,123, Cl. 204-206.000.

Moore, Wildey J. Method of making weighted metal golf club head. 4,558,505, Cl. 29-527.600.

Morabit, Vincent D. Tip stabilizing device for a chain saw. 4,558,518, Cl. 30-371.000.

Mordukhaev, Khanuko M.: *See*—
Kuznetsov, Oleg L.; Maxutov, Rafkhat A.; Malchenok, Vladimir O.; Mordukhaev, Khanuko M.; Ostrovsky, Anatoly P.; Rubtsov, Adolf E.; Simkin, Ernst M.; and Sokolov, Alexei V., 4,558,737, Cl. 166-60.000.

Morgan Construction Company: *See*—
Reardon, Richard J.; Maroti, Endre S.; Roy, Colin; and Lindsay, John S., 4,558,576, Cl. 72-9.000.

Morgan Industries, Inc.: *See*—
Theis, Peter F.; and Buchberger, Gregory D., 4,559,416, Cl. 179-7.10R.

Morgan, Robert K.: *See*—
Yaeger, John R.; and Morgan, Robert K., 4,559,512, Cl. 337-140.000.

Morgunov, Valentin V.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.

Mori, Hideyasu: *See*—
Komuro, Isaku; Mori, Hideyasu; and Sano, Yoshikazu, 4,559,417, Cl. 179-99.0LS.

Mori, Shigeo: *See*—
Kito, Kuniji; Watanabe, Akihiro; and Mori, Shigeo, 4,559,414, Cl. 174-196.000.

Mori, Yoshihiro; Yamamoto, Osamu; and Yamamoto, Kazumasa, to Matsushita Electric Industrial Co., Ltd. Position coordinate input device. 4,558,757, Cl. 178-18.000.

Morigaki, Masakazu: *See*—
Seto, Nobuo; Furutachi, Nobuo; Morigaki, Masakazu; and Nakazyo, Kiyoshi, 4,559,297, Cl. 430-551.000.

Morikawa, Yoshitaka; and Matsui, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Sanitary cleaning equipment. 4,558,473, Cl. 4-420.200.

Morimoto, Mitsutaka: *See*—
Okabayashi, Hidekazu; Morimoto, Mitsutaka; and Nagasawa, Eiji, 4,558,507, Cl. 29-571.000.

Morimoto, Shinichi, to Shimano Industrial Company Limited. Fishing reel. 4,558,828, Cl. 242-7.190.

Morinaga, Hiroshi; Miyake, Satoru; and Sato, Terumi, to Nissan Chemical Industries Ltd. Electrically conductive composition. 4,559,166, Cl. 252-512.000.

Morishita, Akira: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.

Moriya, Koichi: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,559,079, Cl. 71-92.000.

Moriya, Takeo; Yamagata, Toshio; and Sugiyama, Yasunori, to Kimoto & Co., Ltd. Photosensitive recording material developable with aqueous neutral salt solution. 4,559,293, Cl. 430-271.000.

Morper, Manfred, to Linde Aktiengesellschaft. Split feed for the anaerobic biological purification of wastewater. 4,559,142, Cl. 210-607.000.

Morrison, Raymond C.; Gleichauf, Paul H., deceased; and Gleichauf, Theresa C., executrix, to Raytheon Company. Cathode ray tube gun support. 4,559,468, Cl. 313-456.000.

Morsdorf, Peter: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.

Moskalik, Leonid M.: *See*—
Kulesh, Vladimir P.; Moskalik, Leonid M.; Orlov, Anatoly A.; Bliznjuk, Jury A.; and Shtandel, Stanislav K., 4,558,952, Cl. 356-349.000.

Mosley, David R., to M.D.S. Furnace Services Limited. Furnace delining apparatus. 4,558,791, Cl. 212-266.000.

Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, to Toyota Jidosha Kabushiki Kaisha; and Nihon Tokushu Toryo Co., Ltd. Plate metal reinforcing combination. 4,559,252, Cl. 428-57.000.

Motorola, Inc.: *See*—
Abt, Edgar J.; Van Buren, Phillip D.; and Witter, James P., 4,559,525, Cl. 340-347.00P.
Gannon, Mark A.; and Yester, Francis R., Jr., 4,559,490, Cl. 333-202.000.
Suarez, Jose I.; Irwin, James S.; and Shepherd, Wayne P., 4,559,505, Cl. 331-1.00A.

Motrenec, Donald L. All terrain cycle with steering stabilizer. 4,558,878, Cl. 280-272.000.

Moulin, Norbert L.; and Hartley, James T., to Hughes Aircraft Company. Contact alignment tube insertion/removal tool. 4,558,501, Cl. 29-271.000.

Muchow, John D., to Hydril Company. Valve body for multiple valve insert packages. 4,558,716, Cl. 137-269.000.

Mueller, Richard: *See*—
Denzinger, Walter; Hartmann, Heinrich; Trieselt, Wolfgang; Mueller, Richard; Diessel, Paul; and Hettche, Albert, 4,559,159, Cl. 252-174.240.

Mueller, Richard A., to G.D. Searle & Co. 8-Chlorodibenz[b,f][1,4]oxazepine-10(11H)-carboxylic acid, 2-(sulfinyl- and sulfonyl-containing acyl)hydrazides. 4,559,336, Cl. 514-211.000.

Mueller, Richard A., to G.D. Searle & Co. 8-Chlorodibenz[b,f][1,4]oxazepine-10(11H)-carboxylic acid, 2-(alkoxy-containing acyl)hydrazides. 4,559,337, Cl. 514-211.000.

Muggli, Jurg; and Labhart, Martin, to Cerberus AG. Smoke detector with a radiation source operated in a pulse-like or intermittent mode. 4,559,453, Cl. 250-565.000.

Muir, Colin W. A.; and Hendriks, Leonard P., to Johannesburg Consolidated Investment Company Limited. Leaching refractory gold ores. 4,559,209, Cl. 423-30.000.

Mukai, Ryuichi: *See*—
Ueda, Toshio; Kato, Tadashi; Mukai, Ryuichi; and Harada, Susumu, 4,559,391, Cl. 525-366.000.

Mularie, William M., to Vac-Tec Systems, Inc. Method and apparatus for evaporation arc stabilization for permeable targets. 4,559,121, Cl. 204-192.00R.

Mularie, William M., to Vac-Tec Systems, Inc. Apparatus for evaporation arc stabilization during the initial clean-up of an arc target. 4,559,125, Cl. 204-298.000.

Mulhauser, Paul J.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kirk, Karl D., III, to Richard-Allan Medical Industries, Inc. Surgical stapler construction. 4,558,810, Cl. 227-19.000.

Mullani, Nizar A., to Clayton Foundation for Research. Three-dimensional time-of-flight positron emission camera system. 4,559,597, Cl. 364-414.000.

Muller, Arno, to Pitney Bowes Inc. Electronic postage meter having a switching power supply employing integrated circuit timer. 4,559,592, Cl. 363-21.000.

Muller, Heidi: *See*—
Heitmann, Uwe; and Muller, Heidi, 4,558,586, Cl. 73-38.000.

Muller, Jacques: *See*—
Mock, Elmar; and Muller, Jacques, 4,558,957, Cl. 368-294.000.

Mullin, John G., Jr.: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.

Munari, Fausto; Ostan, Giovanni; Saravalle, Carlo; Tosi, Bruno; and Trestianu, Sorin, to Carlo Erba Strumentazione S.p.A. Multi purpose on column injection. 4,559,063, Cl. 55-67.000.

Munson, Robert D., to Emerson Electric Co. Starting and dimming circuit for fluorescent lamps. 4,559,479, Cl. 315-239.000.

Murakami, Katsuo; Yamazaki, Hitoshi; Tanaka, Norihiko; and Ito, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent discharge lamp. 4,559,470, Cl. 313-487.000.

Murakami, Yukihiro: *See*—
Katsuki, Kosuke; and Murakami, Yukihiro, 4,559,010, Cl. 432-59.000.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; and Yorita, Tadahiro, 4,559,508, Cl. 333-202.000.

Murata, Toshinori; Ito, Yuji; and Kazumi, Masafumi, to Hitachi, Ltd. Ghost reduction circuit for a television receiver. 4,559,560, Cl. 358-167.000.

Murayama, Yoshimasa: *See*—
Shiraki, Yasuhiro; Murayama, Yoshimasa; Katayama, Yoshifumi; and Maruyama, Eiichi, 4,559,547, Cl. 357-23.200.

Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Mōrihisa, to Hitachi, Ltd. Upgrading method of low-rank coal. 4,559,060, Cl. 44-23.000.

Murphy, John M.; Spensley, Robert H.; and Ellis, John, to Societe Anonyme d'Explosifs et de Produits Chimiques. Cartridge for use in anchor bolting. 4,558,781, Cl. 206-219.000.

Murphy, John W.; and Vail, David K., to United States of America, Air Force. Digital frequency synthesizer circuit. 4,559,613, Cl. 364-703.000.

Murr, William C., to Bausch & Lomb Incorporated. Method and apparatus for uniform background in visual field testing devices. 4,558,933, Cl. 351-226.000.

Muryoi, Takeshi: *See*—
Omori, Sachio; Naito, Hideshi; Imanari, Hitoshi; and Muryoi, Takeshi, 4,558,927, Cl. 350-429.000.

Musacchia, John. Arrowhead with interchangeable elements. 4,558,868, Cl. 273-422.000.

Mutzhas, Maximilian F. UV Radiation device for phototherapy of dermatoses, especially psoriasis. 4,558,700, Cl. 128-395.000.

Muzika, Karel: *See*—
Zajic, James E.; Hill, Martha A.; Manchester, Donald F.; and Muzika, Karel, 4,559,305, Cl. 435-243.000.

Myers, Robert W., to Paul Brong Machine Works, Inc. Combination cable crimper and cutter. 4,558,584, Cl. 72-407.000.

Myerson, Allan S.; and Ernst, William R., to Georgia Tech Research Institute. Removal of inorganic contaminants from catalysts. 4,559,313, Cl. 502-25.000.

Nabel, Gary: *See*—
Cantor, Harvey I.; and Nabel, Gary, 4,559,310, Cl. 436-519.000.

Nagai, Tadao; and Echigo, Yoshiaki, to Unitika Limited. Method for purification of sulfuric acid solution. 4,559,216, Cl. 423-531.000.

Nagao, Yasuyuki: *See*—
Tanaka, Shinsuke; Tanaka, Fujio; Nagao, Yasuyuki; Imamura, Nobutake; and Ota, Chuichi, 4,559,573, Cl. 360-131.000.

Nagasawa, Eiji: *See*—
Okabayashi, Hidekazu; Morimoto, Mitsutaka; and Nagasawa, Eiji, 4,558,507, Cl. 29-571.000.

Nagata, Masanori, to Toyoda Gosei Co., Ltd. Vehicular seat. 4,558,900, Cl. 296-152.000.

Nagatomo, Shigemi: *See*—
Sakata, Hirotsugu; and Nagatomo, Shigemi, 4,558,997, Cl. 418-55.000.

Nagy, Janos; Nagy, Laszlo ; and Oldal, Endre, to Tungsram Reszvenytarsasag Abr. Tungsram Rt. Electrolytically rhenium coated molybdenum current inlet conductor assembly for vacuum lamps. 4,559,278, Cl. 428-630.000.

Nagy, Jozsef: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.

Nagy, Laszlo : *See*—
Nagy, Janos; Nagy, Laszlo ; and Oldal, Endre, 4,559,278, Cl. 428-630.000.

Naito, Hidemune: *See*—
Kirita, Yasuzo; Kawahashi, Masaru; Kariu, Keiki; Sunahara, Kimihisa; and Naito, Hidemune, 4,559,034, Cl. 604-52.000.

Naito, Hideshi: *See*—
Omori, Sachio; Naito, Hideshi; Imanari, Hitoshi; and Muryoi, Takeshi, 4,558,927, Cl. 350-429.000.

Naito, Masamitsu: *See*—
Kitamura, Hiroshi; Nishikawa, Kaoru; and Naito, Masamitsu, 4,558,543, Cl. 52-2.000.

Nakada, Akio; and Matsuo, Kazumasa, to Olympus Optical Co., Ltd. Device for diagnosing body cavity interiors with ultrasonic waves. 4,558,706, Cl. 128-660.000.

Nakadate, Toshihiko; Numata, Morikuni; Hamada, Akio; and Tsujii, Gen, to Honda Giken Kogyo Kabushiki Kaisha. Welding gun apparatus. 4,559,438, Cl. 219-90.000.

Nakagawa, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,559,551, Cl. 357-38.000.

Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Outboard motor. 4,559,018, Cl. 440-77.000.

Nakahara, James H.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,559,175, Cl. 260-349.000.

Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.

Nakajima, Hiroharu: *See*—
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,558,965, Cl. 400-144.200.

Nakakuki, Tadao: *See*—
Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, 4,559,452, Cl. 250-560.000.

Nakamine, Chosin: *See*—
Matsumoto, Hiroshi; Ishikawa, Yuji; and Nakamine, Chosin, 4,559,519, Cl. 340-286.00M.

Nakamura, Haruo: *See*—
Takei, Katsumori; and Nakamura, Haruo, 4,559,161, Cl. 252-299.630.

Nakamura, Keiji: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.

Nakamura, Masayuki, to Kurita Machinery Manufacturing Company Limited. Apparatus for oscillating filter cloth of filter press. 4,558,641, Cl. 100-198.000.

Nakamura, Minoru. Shirred casing delivery apparatus for meat packing system. 4,558,486, Cl. 17-1.00R.

Nakamura, Tsutomu: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.

Nakamura, Yoichi: *See*—
Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Morihisa, 4,559,060, Cl. 44-23.000.

Nakamura, Yoshihiro: *See*—
Kumazawa, Takahiro; Nakamura, Yoshihiro; and Izawa, Toshihisa, 4,558,695, Cl. 228-183.000.

Nakao, Sho; Kunichika, Kenji; Ohishi, Chikashi; Iwai, Masato; and Iwamoto, Kiyoshi, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor. 4,559,288, Cl. 430-60.000.

Nakashima, Hiroyuki; Tamura, Atuyoshi; Kanbara, Yoichi; and Fujii, Masaharu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Filament for brushmaking. 4,559,268, Cl. 428-397.000.

Nakayama, Kiyoshi, to Asahi Wire Nets & Steel Ltd. Fence of wire latticework. 4,558,851, Cl. 256-24.000.

Nakazato, Kazuo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the air-fuel ratio supplied to a supercharged engine. 4,558,680, Cl. 123-559.000.

Nakazyo, Kiyoshi: *See*—
Seto, Nobuo; Furutachi, Nobuo; Morigaki, Masakazu; and Nakazyo, Kiyoshi, 4,559,297, Cl. 430-551.000.

Naku, Virgil: *See*—
Abplanalp, Robert H.; and Naku, Virgil, 4,559,198, Cl. 264-259.000.

Nambudiri, Easwaran C. N.: *See*—
Eckert, Alton B.; and Nambudiri, Easwaran C. N., 4,559,443, Cl. 235-101.000.

Nangle, John: *See*—
Nangle, Terry; Nangle, John; and Kazim, Salih, 4,558,880, Cl. 280-457.000.

Nangle, Terry; Nangle, John; and Kazim, Salih, to Kazim, Salih. Coupling member. 4,558,880, Cl. 280-457.000.

Nash, Thomas F.: *See*—
Freeman, Gary T.; Maxner, Richard B.; and Nash, Thomas F., 4,558,983, Cl. 414-331.000.

Natori, Takashi, to Tachikawa Spring Co., Ltd. Seat for vehicles. 4,558,905, Cl. 297-452.000.
Natvig, Tore: *See*—
Agback, Karl H.; Natvig, Tore; and Truelove, Sidney C., 4,559,330, Cl. 514-166.000.
Navarrete, Juan A., to Indagraf S/A. Manufacturing of relief printing plates made of photo-sensitive polymeric material. 4,559,294, Cl. 430-306.000.
Naydenov, Ivan H.: *See*—
Petkov, Georgi K.; Botev, Botyo P.; Naydenov, Ivan H.; Metev, Georgi M.; and Petrov, Yakim N., 4,558,579, Cl. 72-56.000.
NEC Corporation: *See*—
Ikeda, Hiroaki, 4,559,619, Cl. 365-190.000.
Okabayashi, Hidekazu; Morimoto, Mitsutaka; and Nagasawa, Eiji, 4,558,507, Cl. 29-571.000.
Negin, Michael: *See*—
McBrearty, Michael; Negin, Michael; Weilerstein, I. Marvin; and Zielenski, Albert J., 4,558,596, Cl. 73-588.000.
Negishi, Kiyoshi: *See*—
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, 4,558,940, Cl. 354-455.000.
NEI Canada Limited: *See*—
Chang, Kwangling; and Dave, Pankaj J., 4,558,529, Cl. 40-473.000.
Neisen, Gerald F., to Brunswick Corp. Marine drive having speed controlled lock-up torque converter. 4,558,769, Cl. 192-3.310.
Nelson, William: *See*—
Pearson, Earl C., Jr.; and Nelson, William, 4,559,537, Cl. 343-7.00A.
Nemeth, Jozsef: *See*—
Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, 4,558,748, Cl. 175-57.000.
Nesbit, Larry A.: *See*—
Kinney, Wayne I.; Koburger, Charles W., III; Lasky, Jerome B.; Nesbit, Larry A.; Troutman, Ronald R.; and White, Francis R., 4,558,508, Cl. 29-571.000.
Nespor, Tony. Thermal wire stripper. 4,558,613, Cl. 81-9.400.
Netter, Michel: *See*—
Marchais, Jean; and Netter, Michel, 4,558,550, Cl. 52-309.700.
Neuman, Eli; and Whitaker, Lew, to Perfectdata. Type element cleaner. 4,558,482, Cl. 15-97.00R.
Neumann, Stephen M.; Pearce, Glenn T.; and Sorrell, Theophilus, to Eastman Kodak Company. Ligands for metallizable dyes. 4,559,291, Cl. 430-214.000.
Neustadt, Bernard R.; Andrews, David R.; and McNamara, Paul E., to Schering Corporation. Antihypertensive agents. 4,559,340, Cl. 514-222.000.
New England Power Service Company: *See*—
Johnston, Reed H., 4,559,520, Cl. 340-310.00R.
Newton, Steven A.; and Bowers, John E., to Leland Stanford Junior University, Board of Trustees of the. Tapped optical fiber delay line. 4,558,920, Cl. 350-96.150.
NGK Insulators, Ltd.: *See*—
Hayashi, Masaru; and Okumura, Tomoyuki, 4,559,171, Cl. 252-629.000.
Kito, Kuniji; Watanabe, Akihiro; and Mori, Shigeo, 4,559,414, Cl. 174-196.000.
Mase, Syunzo; and Soejima, Shigeo, 4,559,126, Cl. 204-425.000.
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,559,193, Cl. 264-60.000.
NGK Spark Plug Co., Ltd.: *See*—
Ito, Masaya, 4,559,277, Cl. 428-627.000.
Nichikeri Chemical Industry Co. Ltd.: *See*—
Asada, Hiroshi; Kobayashi, Kohei; and Iwama, Toshiro, 4,559,143, Cl. 210-714.000.
Nickell, Louis G.; and Stach, Leonard J. 6-Amino-2-ethylthio-4-pyrimidinol as a citrus ripener. 4,559,080, Cl. 71-92.000.
Nickisch, Klaus; Laurent, Henry; Esperling, Peter; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, to Schering Aktiengesellschaft. 7α-Substituted 3-oxo-17α-pregn-4-ene-21,17-carbolactones, process for their production, and pharmaceutical preparations containing same. 4,559,331, Cl. 514-173.000.
Nickol, Friedrich-Wilhelm, to VDO Adolf Schindling AG. Display device with legends formed integrally with electrode structure. 4,559,534, Cl. 340-754.000.
Nieto, Jean-Francois A., to Freyssinet International (STUP) S.A. Anchoring device for a pre-stress cable. 4,558,547, Cl. 52-223.00L.
Nieuwkamp, Wolfgang; and Mezger, Sepp, to Lechler GmbH & Co. KG. Binary atomizing nozzle. 4,558,822, Cl. 239-403.000.
Nihon Medi-Physics Co., Ltd.: *See*—
Arano, Yasushi; Magata, Yasuhiro; and Yokoyama, Akira, 4,559,221, Cl. 424-1.100.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,559,079, Cl. 71-92.000.
Nihon Tokushu Toryo Co., Ltd.: *See*—
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Niigata Engineering Co., Ltd.: *See*—
Minato, Hideo; Fujisaki, Tadashi; Shimizu, Kazufusa; and Koyanagi, Yoshiharu, 4,559,073, Cl. 71-9.000.
Nikolaev, Georgy V.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Feftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.
Nilsson, Erling I., to Tetra Pak Developpement SA. Laminate together with a method for its manufacture. 4,559,257, Cl. 428-152.000.
Nilsson, Karl E., to Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung. Take-up mechanism for safety belts. 4,558,832, Cl. 242-107.000.
Ninomiya, Ken; Nishimatsu, Shigeru; Suzuki, Keizo; Okudaira, Sadayuki; and Ogawa, Yoshifumi, to Hitachi, Ltd. Microwave plasma etching apparatus. 4,559,100, Cl. 156-345.000.
Nippe, Waldemar: *See*—
Kohlmuller, Hans; and Nippe, Waldemar, 4,559,165, Cl. 252-512.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Tomisawa, Norio; and Suzuki, Hideo, 4,558,624, Cl. 84-1.260.
Nippon Kogaku K. K.: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,558,935, Cl. 354-21.000.
Nippon Kogaku K.K.: *See*—
Omori, Sachio; Naito, Hideshi; Imanari, Hitoshi; and Muryoi, Takeshi, 4,558,927, Cl. 350-429.000.
Uehara, Makoto; Sudo, Takeshi; and Kanatani, Fujio, 4,558,949, Cl. 356-152.000.
Nippon Petroleum Refining Company, Limited: *See*—
Hashimoto, Mitsuo; Watanabe, Yasuo; Mama, Fumio; and Odan, Akinori, 4,559,007, Cl. 431-4.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,558,480, Cl. 15-77.000.
Nippon Soken, Inc.: *See*—
Kojima, Akikazu; and Kamiya, Shigeru, 4,558,565, Cl. 60-286.000.
Oshiro, Takao; Fukami, Akira; and Sasaya, Hideaki, 4,558,634, Cl. 98-2.180.
Nippon Telegraph & Telephone: *See*—
Tamamura, Toshiaki; and Niwa, Osamu, 4,559,112, Cl. 204-12.000.
Nippon Zeon Co., Ltd.: *See*—
Watanabe, Noboru; Oyama, Motofumi; and Kubo, Yoichiro, 4,559,390, Cl. 525-349.000.
Nippondenso Co., Ltd.: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Kumazawa, Takahiro; Nakamura, Yoshihiro; and Izawa, Toshihisa, 4,558,695, Cl. 228-183.000.
Oshiro, Takao; Fukami, Akira; and Sasaya, Hideaki, 4,558,634, Cl. 98-2.180.
Nishikawa, Kaoru: *See*—
Kitamura, Hiroshi; Nishikawa, Kaoru; and Naito, Masamitsu, 4,558,543, Cl. 52-2.000.
Nishikawa, Toshio; and Yorita, Tadahiro, to Murata Manufacturing Co., Ltd. Distribution constant filter with suppression of TE11 resonance mode. 4,559,508, Cl. 333-202.000.
Nishimatsu, Masaharu: *See*—
Kubota, Yuichi; Nishimatsu, Masaharu; and Shimada, Shigeru, 4,559,265, Cl. 428-336.000.
Nishimatsu, Shigeru: *See*—
Ninomiya, Ken; Nishimatsu, Shigeru; Suzuki, Keizo; Okudaira, Sadayuki; and Ogawa, Yoshifumi, 4,559,100, Cl. 156-345.000.
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, to Showa Denko K.K.; and Hitachi, Ltd. Secondary battery. 4,559,284, Cl. 429-213.000.
Nishimura, Toshiaki; and Kurokawa, Masahiro, to Mitsubishi Gas Chemical Co., Inc. Process for stabilizing methyleneimine compound and stabilized methyleneimine composition. 4,559,408, Cl. 564-2.000.
Nishimura, Youji: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.
Nishimura, Yutaka; Kuroiwa, Hiroshi; Oyama, Yoshishige; and Teranishi, Takao, to Hitachi, Ltd. Fuel feeding apparatus for internal combustion engine. 4,558,678, Cl. 123-494.000.
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Handotai Kenkyu Shinkokai. Semiconductor fabricating apparatus. 4,558,660, Cl. 118-725.000.
Nissan Chemical Industries Ltd.: *See*—
Morinaga, Hiroshi; Miyake, Satoru; and Sato, Terumi, 4,559,166, Cl. 252-512.000.
Obitsu, Masamichi; and Hori, Takahiro, 4,559,241, Cl. 427-140.000.
Nissan Motor Co., Ltd.: *See*—
Ishikawa, Yasuki; Sone, Masazumi; and Kawai, Akio, 4,558,685, Cl. 123-620.000.
Kiyoshige, Satoshi; Fujikawa, Tadashi; and Eguchi, Shinsuke, 4,558,998, Cl. 418-26.000.
Takahashi, Kotei, 4,558,610, Cl. 74-473.00R.
Tanaka, Shigenori; and Tomita, Kouji, 4,558,723, Cl. 139-452.000.
Nitschmann, Karl; Linke, Wilfried; Dietzsch, Gunter; Hartmann, Werner; Kaiser, Hans-Georg; Meyle, Werner; and Dolata, Hans, to Stihl, Andreas. Saw chain for a chain saw. 4,558,621, Cl. 83-834.000.
Nitta, Yoshiro, to Sony Corporation. Color television camera with a single image pickup tube featuring improved rendition of bright monochromatic objects. 4,559,554, Cl. 358-44.000.
Nitto Boseki: *See*—
Hayashi, Ikuo; Ogihara, Keizo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,559,172, Cl. 260-112.50R.

Nitto Boseki Co., Ltd.: *See*—
Ueda, Toshio; Kato, Tadashi; Mukai, Ryuichi; and Harada, Susumu, 4,559,391, Cl. 525-366.000.
Nitto Kohki Co., Ltd.: *See*—
Shoji, Michihiro; and Mikiya, Toshio, 4,559,577, Cl. 361-31.000.
Niwa, Masatake: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.
Niwa, Osamu: *See*—
Tamamura, Toshiaki; and Niwa, Osamu, 4,559,112, Cl. 204-12.000.
Niwot Corporation: *See*—
Grove, Clinton E.; and Golberg, Jeffery O., 4,558,869, Cl. 277-1.000.
NL Industries, Inc.: *See*—
Barr, John D., 4,558,753, Cl. 175-329.000.
Nobs, Erwin, to Omega SA. Color matrix display with discharge tube light emitting elements. 4,559,480, Cl. 315-324.000.
Noe, Andreas: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 4,558,578, Cl. 72-39.000.
Noe, Oskar; Noe, Rolf; and Noe, Andreas, to BWG-Bergwerk- und Walzwerk-Maschinenbau GmbH. Method of and apparatus for making thin metal strip. 4,558,578, Cl. 72-39.000.
Noe, Rolf: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 4,558,578, Cl. 72-39.000.
Noguchi, Junichi: *See*—
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,558,480, Cl. 15-77.000.
Nojima, Masahiro: *See*—
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Noll, Klaus; Pedain, Josef; and Potter, Terry, to Bayer Aktiengesellschaft. Storage stable oligourethanes which are self cross-linking at elevated temperature or can be cross-linked with organic polyisocyanates, a process for their preparation and their use as binders or binder components. 4,559,397, Cl. 528-45.000.
Nomura, Akihiko; and Fujii, Masahiko, to Toyo Soda Manufacturing Co., Ltd. Process for preventing agglomeration of powders by using triethylenediamine polymers. 4,559,384, Cl. 524-612.000.
Nomura, Yoshika; Sano, Susumu; and Shoji, Sadahiro, to Honshu Seishi Kabushiki Kaisha. Packaging paper and packaging material for packaging metallic material and method of producing the same. 4,559,103, Cl. 162-160.000.
Norden Laboratories, Inc.: *See*—
Kucera, Carrell J., 4,559,306, Cl. 435-253.000.
Nordstrom, Larry A.: *See*—
Fuller, Robert P.; and Nordstrom, Larry A., 4,559,478, Cl. 315-224.000.
Norsworthy, Keith, to Boeing Company, The. Method and apparatus for random array beamforming. 4,559,605, Cl. 364-726.000.
North American Philips Corporation: *See*—
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,559,280, Cl. 428-633.000.
Norton Christensen, Inc.: *See*—
Fulkerson, Larry R., 4,558,749, Cl. 175-58.000.
Nosaki, Takefumi; Tanimoto, Koji; and Hosoya, Masahiro. Developing apparatus. 4,558,941, Cl. 355-3.0DD.
Noser, Anne M. Dental brushing aid. 4,558,483, Cl. 15-167.00R.
Noto, Sal J.; and Wartenbergh, Robert P., to Dysan Corporation. Removable disk cartridge with improved door operating mechanism. 4,559,575, Cl. 360-133.000.
Novex Talalmanyfejleszto es Novexesitolmalyereskedelmi Rt.: *See*—
Gyulavari, Imre, 4,559,141, Cl. 210-521.000.
Nowack, Daniel P.: *See*—
Horner, Herbert F., Jr.; Zenner, Michael M.; Nowack, Daniel P.; and Christopherson, Herman P., 4,558,558, Cl. 56-11.300.
Nozaki, Nobuharu: *See*—
Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Kido, Keishiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,559,289, Cl. 430-66.000.
NPSP po Hydroplastichna Obrabotka na Metalite: *See*—
Petkov, Georgi K.; Botev, Botyo P.; Naydenov, Ivan H.; Metev, Georgi M.; and Petrov, Yakim N., 4,558,579, Cl. 72-56.000.
Nugent, Nancy: *See*—
Schroedel, Helmut; and Nugent, Nancy, 4,558,527, Cl. 40-343.000.
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., to Wilkerson Corporation. Twin tower gas fractionation apparatus. 4,559,065, Cl. 55-161.000.
Numata, Morikuni: *See*—
Nakadate, Toshihiko; Numata, Morikuni; Hamada, Akio; and Tsujii, Gen, 4,559,438, Cl. 219-90.000.
Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Variable image magnification eye fundus camera. 4,558,932, Cl. 351-206.000.
Nurck, Wilhelm: *See*—
Kirchesch, Heinz-Peter; Nurck, Wilhelm; and Widl, Wolfgang, 4,559,425, Cl. 200-146.00R.
Nusbaum, Arthur, to Nusbaum, Robert; Nusbaum, Howard; and Selick, Barbara. Underfloor assembly and cable distribution system and cable trench therefor. 4,558,546, Cl. 52-221.000.
Nusbaum, Howard: *See*—
Nusbaum, Arthur, 4,558,546, Cl. 52-221.000.
Nusbaum, Robert: *See*—
Nusbaum, Arthur, 4,558,546, Cl. 52-221.000.
Nutek, Incorporated: *See*—
Mackie, Ronald D., 4,558,673, Cl. 123-416.000.
Nutter, Robert C.; and Panganiban, Lucy C., to Stauffer Chemical Co. Corynebacterium plasmid and vector. 4,559,308, Cl. 435-317.000.
Nyitrai, Jozsef: *See*—
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.
O-M Limited: *See*—
Tada, Akira; and Tanigawa, Koichi, 4,559,030, Cl. 493-252.000.
O.T.H. Beier & Company (Proprietary) Limited: *See*—
Beier, Oskar H. G.; Kerf, Joseph B. J.; and Ekegren, Sven G., 4,558,574, Cl. 68-18.00R.
Oak Industries Inc.: *See*—
Van Zeeland, Anthony J.; Larson, Willis A.; and Christensen, David A., 4,559,426, Cl. 200-159.00B.
Oakley, David J.; and Groves, Oliver J., to United States of America, Energy. Evacuate and backfill apparatus and method. 4,558,982, Cl. 414-288.000.
Oakley, John R., to Metal Box Public Limited Company. Sealing lids to tray-like containers. 4,559,092, Cl. 156-69.000.
Obitsu, Masamichi; and Hori, Takahiro, to Nissan Chemical Industries, Ltd. Method for preventing hardened cementitious material from deteriorating. 4,559,241, Cl. 427-140.000.
O'Boyle, Dolores; and Hittel, William C., to International Playtex, Inc. Brassiere support element. 4,558,705, Cl. 128-476.000.
O'Boyle, John M.: *See*—
Goulstone, Ray T.; Gursky, Michael T.; and O'Boyle, John M., 4,558,581, Cl. 72-379.000.
O'Brien, Jay P.: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.
O'Brien, Kay I. Curtain for shower doors. 4,558,475, Cl. 4-607.000.
Ochi, Yoshinori: *See*—
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,558,480, Cl. 15-77.000.
Odan, Akinori: *See*—
Hashimoto, Mitsuo; Watanabe, Yasuo; Mama, Fumio; and Odan, Akinori, 4,559,007, Cl. 431-4.000.
O'Dell, Lawrence W. Laser canaliculostomy eye-treatment. 4,558,698, Cl. 128-303.100.
Oerlikon-Boehringer GmbH: *See*—
Berbalk, Hermann, 4,558,978, Cl. 409-200.000.
Oertle, Konrad: *See*—
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Achim; and Topfl, Werner, 4,559,078, Cl. 71-87.000.
Ogasawara, Masahiro: *See*—
Tani, Keizo; and Ogasawara, Masahiro, 4,558,510, Cl. 29-588.000.
Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Vane type pump device. 4,558,999, Cl. 418-173.000.
Ogawa, Mutsuo: *See*—
Katsuragi, Shigeru; Hakkaku, Kunio; and Ogawa, Mutsuo, 4,559,565, Cl. 358-296.000.
Ogawa, Yoshifumi: *See*—
Ninomiya, Ken; Nishimatsu, Shigeru; Suzuki, Keizo; Okudaira, Sadayuki; and Ogawa, Yoshifumi, 4,559,100, Cl. 156-345.000.
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Method of sealing open ends of ceramic honeycomb structural body. 4,559,193, Cl. 264-60.000.
Ogihara, Keizo: *See*—
Hayashi, Ikuo; Ogihara, Keizo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,559,172, Cl. 260-112.50R.
Ogunro, E. Olayinka. Selectively removable prosthetic nail. 4,559,055, Cl. 623-11.000.
Ohashi, Hideki: *See*—
Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,559,201, Cl. 422-63.000.
Ohba, Shinya: *See*—
Koike, Norio; Ohba, Shinya; and Masuhara, Toshiaki, 4,559,550, Cl. 357-24.000.
Ohhara, Minoru: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.
Ohishi, Chikashi: *See*—
Nakao, Sho; Kunichika, Kenji; Ohishi, Chikashi; Iwai, Masato; and Iwamoto, Kiyoshi, 4,559,288, Cl. 430-60.000.
Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,558,660, Cl. 118-725.000.
Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,559,327, Cl. 514-42.000.
Ohnishi, Katsumi, to Fujitsu Limited. History memory control system. 4,559,596, Cl. 364-200.000.
Ohzono, Kouhei: *See*—
Uchibaba, Kouichi; Hayashi, Tsutomu; Ishikawa, Haruo; and Ohzono, Kouhei, 4,559,023, Cl. 464-30.000.
Oikawa, Shuetsu: *See*—
Igaki, Seigo; Nakakuki, Tadao; Inagaki, Takefumi; Oikawa, Shuetsu; and Fujimura, Takashi, 4,559,452, Cl. 250-560.000.
Oiles Industry Co., Ltd.: *See*—
Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, 4,559,249, Cl. 428-36.000.
Sumiyoshi, Kikuo; and Miyasaka, Kingo, 4,559,248, Cl. 428-36.000.
Oizumi, Junichi: *See*—
Kan, Kazutoshi; and Oizumi, Junichi, 4,559,633, Cl. 375-1.000.

Oka, Yoshikazu, to Senju Pharmaceutical Co., Ltd. Naphthalenecarboxamides, their production and use. 4,559,361, Cl. 514-620.000.
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Burli, Martin; Bersier, Jacques; Plattner, Eric; and Herrmann, Hans-Ulrich, 4,559,176, Cl. 260-352.000.

Plessis, Andre : *See*—
Le Guen, Jacques; Delair, Jacques; and Plessis, Andre , 4,559,640, Cl. 378-113.000.

Pletcher, Erwin C. Orthodontic bracket. 4,559,012, Cl. 433-10.000.

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Pohl, Karl-Heinz, to Siemon Company, The. Multiple electrical connector and block having a back to back configuration. 4,558,919, Cl. 339-206.00R.

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Pol, Kenneth J.: *See*—
Draper, Reed T.; and Pol, Kenneth J., 4,558,803, Cl. 221-229.000.

Polaroid Corporation: *See*—
Petersen, Christian C., 4,558,936, Cl. 354-86.000.
Petersen, Christian C.; and Wasson, Ken G., 4,558,937, Cl. 354-234.100.
Petersen, Christian C., 4,558,938, Cl. 354-234.100.

Poltorak, Alexandr P.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.

Polychrome Corporation: *See*—
Rowe, William; Dooley, Thomas; and Shah, Ajay, 4,559,401, Cl. 544-216.000.

Polyplastics Company, Ltd.: *See*—
Kasuga, Takuzo; Ikenaga, Yukio; Yamawaki, Masami; and Tanimura, Keizo, 4,559,380, Cl. 524-317.000.

Polysar Limited: *See*—
Ahlberg, David T., 4,559,108, Cl. 202-154.000.

Poncet, Jean. Apparatus for manufacturing webs of polymer foam and a product obtained. 4,559,003, Cl. 425-224.000.

Poole, Eddie D.: *See*—
Horton, Gilbert L.; Poole, Eddie D.; and Foreman, John W., Jr., 4,558,653, Cl. 112-262.200.

Poplis, John: *See*—
Theilig, Arthur W.; and Poplis, John, 4,558,661, Cl. 119-43.000.

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McAneney, T. Brian; Loutfy, Rafik O.; Ong, Beng S.; and Popovic, Zoran D., 4,559,287, Cl. 430-59.000.

Porges, Etienne, to Synthelabo. Bags for medical use and intended in particular for parenteral nutrition. 4,559,053, Cl. 604-408.000.

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Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.

Potter, Terry: *See*—
Noll, Klaus; Pedain, Josef; and Potter, Terry, 4,559,397, Cl. 528-45.000.

Powell, Herbert L.: *See*—
Powell, John J.; and Powell, Herbert L., 4,558,746, Cl. 172-421.000.

Powell, John G., to Southern California Edison Company, Inc. Siren. 4,558,656, Cl. 116-147.000.

Powell, John J.; and Powell, Herbert L. Lawn working implement. 4,558,746, Cl. 172-421.000.

Powell, Richard L., to Imperial Chemical Industries PLC. Heat pumps. 4,559,154, Cl. 252-69.000.

PPG Industries, Inc.: *See*—
Kunkle, Gerald E.; and Matesa, Joseph M., 4,559,071, Cl. 65-135.000.
Van Gemert, Barry, 4,559,081, Cl. 71-93.000.

Pracht, Inge: *See*—
Hirth, Georges; Petrzilka, Martin; and Pracht, Inge, 4,559,147, Cl. 252-1.000.

Praeg, Walter F., to United States of America, Energy. Dual aperture dipole magnet with second harmonic component. 4,559,578, Cl. 361-139.000.

Prager, Jay M.; and Gonzales, Roman Y., to Gould Inc. Readily expandable input/output construction for programmable controller. 4,558,914, Cl. 339-75.00R.

Preciculture: *See*—
Lestradet, Denis, 4,558,760, Cl. 180-169.000.

Precision Valve Corporation: *See*—
Abplanalp, Robert H.; and Naku, Virgil, 4,559,198, Cl. 264-259.000.

Pregozen, David; and Hiller, John J., Jr., to Sterling Drug Inc. Antistatic fabric conditioner compositions and method. 4,559,151, Cl. 252-8.800.

Preliasco, Richard J.: *See*—
Craighead, Norwood D., II; Preliasco, Richard J.; and Hult, Timothy D., 4,558,967, Cl. 403-113.000.

Prestele, Karl: *See*—
Franetzki, Manfred; Gagneur, Klaus; and Prestele, Karl, 4,559,037, Cl. 604-151.000.

Primo Company Limited: *See*—
Imai, Nobuomi, 4,559,418, Cl. 179-111.00E.

Prince Corporation: *See*—
Chu, Zooey C.; and Dykstra, Ronald A., 4,558,899, Cl. 296-97.00G.

Process Scientific Innovations Limited: *See*—
Hunter, George S.; Walker, Brian; and Merrie, Kenneth, 4,559,066, Cl. 55-274.000.

Procter & Gamble Company, The: *See*—
Brown, Bruce; and Strickland, Wilbur C., Jr., 4,558,471, Cl. 4-228.000.
Wevers, Jean; Halas, Linda A.; and Peltre, Philippe R., 4,559,169, Cl. 252-543.000.

Progressive Development Incorporated: *See*—
Duske, Wilfried P.; and Frank, Lowell C., 4,558,525, Cl. 34-128.000.

Prukop, Gabriel: *See*—
Ashrawi, Samir S.; and Prukop, Gabriel, 4,559,148, Cl. 252-8.55D.

Pufal, Rolf H., to Klockner-Humboldt-Deutz AG. Seal means for couplings in gas conduits. 4,558,871, Cl. 277-84.000.

Purdue Research Foundation: *See*—
Ash, Stephen R.; and Kaufman, Geraldine M., 4,559,039, Cl. 604-175.000.

Puricelli, Laura, to Magis Farmaceutici S.R.L. Cysteine derivatives, a process for their preparation, and pharmaceutical compositions which contain them. 4,559,360, Cl. 514-548.000.

Purvis, James A.: *See*—
Dangerfield, Danny E.; and Purvis, James A., 4,558,783, Cl. 206-472.000.

Q&Q Retreading System AB: *See*—
Berggren, Benny; and Gripenholt, Ninneh, 4,559,093, Cl. 156-96.000.

Quadri Corporation: *See*—
Bruder, John F., 4,559,616, Cl. 365-28.000.

Quest Medical, Inc.: *See*—
Robinson, Thomas P.; Killman, Don M.; Mattson, Andrew P.; and Hudson, James E., Jr., 4,559,044, Cl. 604-246.000.

Quest Product Development, Ltd.: *See*—
Mitchell, Terry L., 4,558,797, Cl. 220-84.000.

Quick, Roy F., Jr.: *See*—
Bass, Leland J.; Quick, Roy F., Jr.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,559,533, Cl. 340-724.000.

Quikduc of California, Inc.: *See—*
Daw, David E.; and Vlastnik, Arthur F., 4,558,892, Cl. 285-331.000.
Quinlan, Patrick M., to Petrolite Corporation. Halide free octahydrophenanthridine corrosion inhibitors. 4,559,163, Cl. 252-392.000.
Quintavalle, Saverio; and Gargani, Luciano, to AGIP Petroli S.p.A.; and Industria Italiana Petroli S.p.A. Process for the production of expanded reticulated polyethylene. 4,559,190, Cl. 264-45.300.
Quiogue, Honesto D.; and Lewin, Ian, to Harvey Hubbell Incorporated. Wall mounted luminaire. 4,559,587, Cl. 362-147.000.
Raaf, Helmut, to Blendax-Werke R. Schneider GmbH & Co. Tooth and mouth care agent. 4,559,224, Cl. 424-54.000.
Rabe, James A.: *See—*
Bauman, Therese M.; Lee, Chi-long; and Rabe, James A., 4,559,369, Cl. 521-98.000.
Rabolt, John F.: *See—*
Schlotter, Nicholas E.; and Rabolt, John F., 4,559,447, Cl. 250-231.0SE.
Rabuse, George R.: *See—*
Hanson, Gary R.; and Rabuse, George R., 4,558,888, Cl. 281-23.000.
Rackley, John M.: *See—*
Downs, William; and Rackley, John M., 4,558,652, Cl. 110-347.000.
Rahn, Raymond A. Warning system for school buses. 4,559,517, Cl. 340-75.000.
Rainer, Hans-Peter: *See—*
Rock, Siegfried; Rainer, Hans-Peter; Herzog, Reinhold; Wertitsch, Werner; Kromus, Gunter; and Kolbl, Fritz, 4,558,638, Cl. 98-88.100.
Ramasco, Carlo, to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A. Combing machine for textile fibres. 4,558,491, Cl. 19-215.000.
Ramsdale, Kurt A.; and Harter, Richard M., to Simmonds Precision Products, Inc. Controlled hybrid microcircuit oscillator. 4,559,507, Cl. 331-183.000.
Ransom, Dean A.: *See—*
Benjamin, Thomas A.; and Ransom, Dean A., 4,559,035, Cl. 604-73.000.
Rao, Surendra B., to Battelle Memorial Institute. Monitoring machine tool conditions by measuring a force component and a vibration component at a fundamental natural frequency. 4,559,600, Cl. 364-474.000.
Rath, Klaus: *See—*
Distelrath, Heinz D.; Wiegand, Herbert; Rath, Klaus; and Baumer, Klaus, 4,559,008, Cl. 431-63.000.
Rausch, Werner: *See—*
Jorns, Peter; Meyer, Norbert; Rausch, Werner; Rothkegel, Josef; Luckhardt, Gunther; and Volling, Gudrun, 4,559,087, Cl. 148-6.15Z.
Rawlings, Robert L.: *See—*
McGill, Eugene C.; and Rawlings, Robert L., 4,559,006, Cl. 431-3.000.
Raychem Corporation: *See—*
Kruger, Franz J.; and Szalvay, Laszlo, 4,559,283, Cl. 429-174.000.
Yaeger, John R.; and Morgan, Robert K., 4,559,512, Cl. 337-140.000.
Raytheon Company: *See—*
Morrison, Raymond C.; Gleichauf, Paul H., deceased; and Gleichauf, Theresa C., executrix, 4,559,468, Cl. 313-456.000.
Pearson, Earl C., Jr.; and Nelson, William, 4,559,537, Cl. 343-7.00A.
Razi, M. Dean. Cannula introducers. 4,559,041, Cl. 604-157.000.
RCA Corporation: *See—*
Dietz, Wolfgang F. W., 4,559,481, Cl. 315-411.000.
Hoover, Merle V., 4,559,476, Cl. 315-39.000.
Read, John C.: *See—*
Vacanti, David C.; Read, John C.; and Takeuchi, Jimmy S., 4,559,489, Cl. 333-1.100.
Reardon, Richard J.; Maroti, Endre S.; Roy, Colin; and Lindsay, John S., to Morgan Construction Company. Automatic gauge control system for multi-stand tied block rod rolling mill. 4,558,576, Cl. 72-9.000.
Reber, Jean-Francois: *See—*
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,559,237, Cl. 427-53.100.
Redding, James A. Large capacity sample bucket and bucket sampler having low clearance. 4,558,602, Cl. 73-863.530.
Rediffusion Simulation Limited: *See—*
Campbell, Douglas R., 4,559,014, Cl. 434-58.000.
Reed Rock Bit Company: *See—*
Childers, John S.; and Pastusek, Paul E., 4,558,754, Cl. 175-340.000.
Reeves, James B., Jr. Adjustment pitch sprocket. 4,559,028, Cl. 474-162.000.
Regel, Erik; Draber, Wilfried; Buchel, Karl H.; Frohberger, Paul-Ernst; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Azolyl-thioether derivatives as fungicides and plant growth regulators. 4,559,077, Cl. 71-76.000.
Regie Nationale des Usines Renault: *See—*
Boccadoro, Yves; and Lepretre, Bernard, 4,558,672, Cl. 123-325.000.
Regina Corporation: *See—*
Groth, Hugh F., 4,558,484, Cl. 15-320.000.
Groth, Hugh F., 4,558,823, Cl. 239-413.000.
Reilly, James E.: *See—*
Smith, James A.; and Reilly, James E., 4,559,157, Cl. 252-90.000.
Reinecke, Paul: *See—*
Kraatz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.
Reiners, Franz-Josef: *See—*
Aretz, Ulrich; Knors, Herbert; Maassen, Wilhelm; Reiners, Franz-Josef; and Tholen, Leo, 4,558,829, Cl. 242-35.50A.
Reisch, Bruno: *See—*
Passler, Michel; and Reisch, Bruno, 4,559,243, Cl. 427-209.000.
Reiss, John R.; and Katz, Richard, to American Standard Inc. Control valve device arranged for direct or graduated release operation. 4,558,907, Cl. 303-74.000.
Reitter, Richard G., II, to Reitter Stucco, Inc. Building panel and process for making. 4,558,552, Cl. 52-741.000.
Reitter Stucco, Inc.: *See—*
Reitter, Richard G., II, 4,558,552, Cl. 52-741.000.
Renard, Lucien: *See—*
Moore, Jean-Pierre; Winand, Rene ; Weymeersch, Alain; and Renard, Lucien, 4,559,123, Cl. 204-206.000.
Reniero, Cirillo S.: *See—*
Folco, Luciano; and Reniero, Cirillo S., 4,559,122, Cl. 204-201.000.
Research Corporation: *See—*
Bruck, Stephen D., 4,559,054, Cl. 604-892.000.
Research-Cottrell, Inc.: *See—*
Feldman, Paul L.; and Gleason, Robert J., 4,559,211, Cl. 423-242.000.
Research Foundation: *See—*
Page, Robert K.; Villegas, Pedro; Eidson, Caswell S.; and Gaudry, Daniel, 4,559,229, Cl. 424-89.000.
Reusser, Robert E., to Phillips Petroleum Company. Catalysts for olefin conversions. 4,559,320, Cl. 502-251.000.
Reynolds, John G.; Yu, S. Gary; and Lewis, Robert T., to Chevron Research Company. Red mud as a first-stage catalyst in a two-stage, close-coupled thermal catalytic hydroconversion process. 4,559,129, Cl. 208-59.000.
Reynolds, John G.; Yu, S. Gary; and Beret, Samil, to Chevron Research Company. Metals-impregnated red mud as a first-stage catalyst in a two-stage, close-coupled thermal catalytic hydroconversion process. 4,559,130, Cl. 208-59.000.
Reynolds, Matthew R.: *See—*
Hite, John B.; and Reynolds, Matthew R., 4,558,492, Cl. 24-37.000.
Rheinmetall GmbH: *See—*
Bartolles, Rolf, 4,558,626, Cl. 89-24.000.
Boeder, Dieter; and Grosswendt, Werner, 4,558,645, Cl. 102-489.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Bauer, Denise ; Fourre, Patrick; and Sabot, Jean-Louis, 4,559,203, Cl. 423-112.000.
Rhone-Poulenc Specialities Chimiques: *See—*
Giroud-Abel, Bruno, 4,559,372, Cl. 523-205.000.
Richard-Allan Medical Industries, Inc.: *See—*
Mulhauser, Paul J.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kirk, Karl D., III, 4,558,810, Cl. 227-19.000.
Richards, Frank P., to Sealright Co., Inc. Container and sidewall blank having sinusoidal edge pattern. 4,558,813, Cl. 229-4.500.
Richardson, Mark A.: *See—*
Kovacevic, Steven; Fayerman, Jeffrey T.; Miller, James R.; and Richardson, Mark A., 4,559,300, Cl. 435-68.000.
Richey, Phillip C.: *See—*
Peek, Charles L.; Richey, Phillip C.; and Summers, James H., 4,559,614, Cl. 364-900.000.
Richter, Dag: *See—*
Haour, Georges; Richter, Dag; and Wagnieres, Willy, 4,559,187, Cl. 264-11.000.
Richter Gedeon Vegyeszeti Gyav R.T.: *See—*
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.
Richter, Herbert, to Herbert Richter Metallwaren-Apparate bau GmbH & Co. Fashion trim article. 4,558,469, Cl. 2-60.000.
Ricoh Company, Ltd.: *See—*
Furukawa, Tatsuya; and Horike, Masanori, 4,558,995, Cl. 417-322.000.
Katsuragi, Shigeru; Hakkaku, Kunio; and Ogawa, Mutsuo, 4,559,565, Cl. 358-296.000.
Matsumoto, Shuzo; Isayama, Takuro; Yamazaki, Hiroshi; and Katano, Yasuo, 4,559,544, Cl. 346-140.00R.
Mayer, Edward F., 4,559,509, Cl. 355-3.0TR.
Riegger, Wolfgang: *See—*
Chlosta, Wolfgang; and Riegger, Wolfgang, 4,558,603, Cl. 73-864.210.
Rientjes, Gerardus J. A.: *See—*
Eijkelenkamp, Antonius J. H.; Held, Jan H.; and Rientjes, Gerardus J. A., 4,559,581, Cl. 361-433.000.
Ries, Gunter, to Siemens Aktiengesellschaft. Protection device for a superconducting magnetic coil assembly. 4,559,576, Cl. 361-19.000.
Rieter Machine Works Ltd.: *See—*
Lattion, Andre , 4,558,776, Cl. 198-429.000.
Rilett Engergitjanst AB: *See—*
Lindroos, Runar, 4,558,733, Cl. 165-94.000.
Rinkewich, Isaac. Cyclically-operable valve particularly for irrigation. 4,558,719, Cl. 137-624.140.
Ritson, Carl: *See—*
Danby, Hal C.; and Ritson, Carl, 4,559,045, Cl. 604-250.000.

Roach, Peter F.; Duncombe, Edward; and Hulse, Ian, to United Kingdom Atomic Energy Authority. Heat exchanger tube repair. 4,559,436, Cl. 219-85.00M.

Roach, Stewart W., to Marco Seattle, Inc. Composite pumping system. 4,558,990, Cl. 417-54.000.

Robben, Franklin A., to United States of America, Energy. Superheated fuel injection for combustion of liquid-solid slurries. 4,558,664, Cl. 123-23.000.

Robert Bosch GmbH: *See*—
Jundt, Werner; Kosak, Wolfgang; and Werner, Peter, 4,559,483, Cl. 318-301.000.
Sautter, Helmut, 4,558,924, Cl. 350-357.000.

Roberts, Derek H.; and Pepper, Michael, to General Electric Company, p.l.c., The. Data storage devices with vertical charge transfer. 4,559,549, Cl. 357-24.000.

Roberts, Helen F.: *See*—
Guthrie, James L.; Roberts, Helen F.; and Lundsager, Christian B., 4,559,373, Cl. 523-220.000.

Robinson, Thomas P.; Killman, Don M.; Mattson, Andrew P.; and Hudson, James E., Jr., to Quest Medical, Inc. Volumetric metering unit for intravenous fluid addition. 4,559,044, Cl. 604-246.000.

Robinson, Vivian N. E.; and Cutmore, Nicholas G., to Unisearch Limited. Quantitative compositional analyser for use with scanning electron microscopes. 4,559,450, Cl. 250-310.000.

Robinson, William V., Jr.; and Shively, Richard R., to AT&T Bell Laboratories. Full adder using transmission gates. 4,559,609, Cl. 364-784.000.

Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge including C-shaped member for mounting hinge links to hinge casing. 4,558,485, Cl. 16-370.000.

Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers or the like. 4,558,908, Cl. 308-3.800.

Rock, Siegfried; Rainer, Hans-Peter; Herzog, Reinhold; Wertitsch, Werner; Kromus, Gunter; and Kolbl, Fritz, to Contacting-Gesellschaft fur Wirlshaftskontakte GmbH. Ventilating profile frames for closure panels. 4,558,638, Cl. 98-88.100.

Rock-Tenn Company: *See*—
Wischusen, Henry, III, 4,558,815, Cl. 229-31.00R.

Rockwell International Corporation: *See*—
Gay, Richard L.; and Grantham, LeRoy F., 4,559,170, Cl. 252-628.000.
Goldberg, Ira B.; Chung, Kwang E.; and Fadner, Thomas A., 4,559,493, Cl. 324-61.00R.

Roddiger, Henry A.: *See*—
Malmstrom, Herbert A.; and Roddiger, Henry A., 4,558,636, Cl. 98-39.100.

Rodi & Wienenberger AG: *See*—
Herchenbach, Wolfgang, 4,558,955, Cl. 368-282.000.

Roehrs, Robert E.: *See*—
Han, Wesley W.; and Roehrs, Robert E., 4,559,343, Cl. 514-264.000.

Roets, Sarel D., to Silverton Tannery Limited. Method of clarifying proteinaceous waste water containing solid impurities. 4,559,146, Cl. 210-705.000.

Rohrbach, Walter, to Midwest Automation, Inc. Spraying apparatus. 4,558,657, Cl. 118-70.000.

Rolco International B.V.: *See*—
Boelen, Adrianus G. M., 4,558,617, Cl. 83-425.100.

Rolls-Royce Limited: *See*—
Jones, William R., 4,559,246, Cl. 427-299.000.

Roloff, Achim: *See*—
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Achim; and Topfl, Werner, 4,559,078, Cl. 71-87.000.

Rong, Pan F.: *See*—
Liu, Eddy Y. L.; and Rong, Pan F., 4,559,085, Cl. 134-22.110.

Roodvoets, David L., to Dow Chemical Company, The. Cement-foam composite board. 4,559,263, Cl. 428-312.400.

Roos, Sture G.; Fagerstedt, Nils U. H.; and Pehrson, Jens E., to Telefonaktiebolaget LM Ericsson. Digital concentrator. 4,559,624, Cl. 370-56.000.

Roose, Charles A.: *See*—
Hagler, Ernest; Roose, Charles A.; and Claypool, John B., 4,558,713, Cl. 135-106.000.

Rosenberg, Isadore: *See*—
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,558,470, Cl. 2-414.000.

Rosenhahn, Lothar: *See*—
Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, 4,559,296, Cl. 430-519.000.

Rothkegel, Josef: *See*—
Jorns, Peter; Meyer, Norbert; Rausch, Werner; Rothkegel, Josef; Luckhardt, Gunther; and Volling, Gudrun, 4,559,087, Cl. 148-6.15Z.

Rotman, M. Boris, to Brown University Research Foundation Inc. Cytotoxicity assays in cell culturing devices. 4,559,299, Cl. 435-29.000.

Rovema Verpackungsmaschinen GmbH: *See*—
Schmitt, Reinhold; Herbert, Manfred; and Baur, Walter, 4,558,779, Cl. 198-627.000.

Rowe, William; Dooley, Thomas; and Shah, Ajay, to Polychrome Corporation. Process for preparing chromophore-substituted vinyl-halomethyl-s-triazines. 4,559,401, Cl. 544-216.000.

Roy, Colin: *See*—
Reardon, Richard J.; Maroti, Endre S.; Roy, Colin; and Lindsay, John S., 4,558,576, Cl. 72-9.000.

Royse, Vicki L.; and Jensen, Donald M., to Rush-Presbyterian-St. Luke's Medical Center. Agarose gel electrophoresis technique for the determination of amylase isoenzymes. 4,559,120, Cl. 204-182.800.

Rozental, Eduard S.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.

Rozsa, Kalman, to Facit Aktiebolag. Method and device for measuring backlash in a drive mechanism comprising a screw and a nut. 4,559,448, Cl. 250-231.0SE.

Rubin, Leon J.; Diosady, Levente L.; Shahidi, Fereidoon; and Wood, Darrell F., to Canadian Patents and Development Limited. Meat curing compositions and method of use. 4,559,234, Cl. 426-250.000.

Rubtsov, Adolf E.: *See*—
Kuznetsov, Oleg L.; Maxutov, Rafkhat A.; Malchenok, Vladimir O.; Mordukhaev, Khanuko M.; Ostrovsky, Anatoly P.; Rubtsov, Adolf E.; Simkin, Ernst M.; and Sokolov, Alexei V., 4,558,737, Cl. 166-60.000.

Rudich, George, Jr.; and Troup, David L., to Johnson Service Company. Method of controlling a space heating system. 4,559,441, Cl. 219-364.000.

Rueff, Herbert; and Manfredi, Oscar, to Azionaria Costruzioni Macchine Automatiche - A.C.M.A. - S.p.A. Feeder e.g. for soap tablets to wrapping machine. 4,558,555, Cl. 53-493.000.

Runzi, Kurt. Sheet supply apparatus for typewriters, having slewing rollers engaging a platen roll, and method. 4,558,858, Cl. 271-22.000.

Ruoff, Carl F., to California Institute of Technology. Rolling contact robot joint. 4,558,911, Cl. 339-5.00M.

Rush-Presbyterian-St. Luke's Medical Center: *See*—
Royse, Vicki L.; and Jensen, Donald M., 4,559,120, Cl. 204-182.800.

Rutsch, Werner: *See*—
Husler, Rinaldo; Kirchmayr, Rudolf; and Rutsch, Werner, 4,559,371, Cl. 204-158.00R.

Rutter, Thomas M., to Fab-Form Products, Inc. Jack adapter. 4,558,848, Cl. 254-100.000.

Ryan, Norman W.; and Peperakis, Angelo, Jr., to University of Utah. Steam generator apparatus and method. 4,558,743, Cl. 166-303.000.

S. C. Johnson & Son, Inc.: *See*—
Harris, William C., Jr., 4,558,820, Cl. 239-56.000.

S.O.C. Corporation: *See*—
Arikawa, Hiroo, 4,559,514, Cl. 337-201.000.

Sabot, Jean-Louis: *See*—
Bauer, Denise ; Fourre, Patrick; and Sabot, Jean-Louis, 4,559,203, Cl. 423-112.000.

Sachs, Neville W., to Allied Corporation. Bolt demonstrator. 4,558,599, Cl. 73-761.000.

Saeki, Keiso: *See*—
Mitsuo, Hirofumi; Watanabe, Shojiro; and Saeki, Keiso, 4,559,242, Cl. 427-150.000.

Safe-T-Jack, Inc.: *See*—
Arzouman, Harry H., 4,558,846, Cl. 254-8.00B.

Saha, Murari M., to ASEA Aktiebolag. Method and device for locating a fault point on a three-phase power transmission line. 4,559,491, Cl. 324-52.000.

Saiki, Junichi: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.

Sailas, Vaino; Sailas: *See*—
Skytta, Osmo; and Sailas, Vaino; Sailas, 4,559,106, Cl. 162-358.000.

Saito, Norito shi: *See*—
Kumasaka, Noriyuki; Fujiwara, Hideo; Otomo, Shigekazu; Yamashita, Takeo; Takayama, Shinji; Saito, Noritoshi; Kobayashi, Nobuo; and Kudo, Mitsuhiro, 4,559,572, Cl. 360-110.000.

Sakaguchi, Shozo; and Yanagi, Kunio, to Jidosha Kiki Co. Ltd. Fluid reservoir having a seal and cover. 4,558,798, Cl. 220-256.000.

Sakamoto, Atsushi: *See*—
Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, 4,559,642, Cl. 381-92.000.

Sakamoto, Katsuyoshi, to Amada Company, Limited. Punch press having retractable punching tools. 4,558,616, Cl. 83-399.000.

Sakata, Hirotsugu; and Nagatomo, Shigemi, to Tokyo Shibaura Denki Kabushiki Kaisha. Scroll compressor with planar surfaces on the internal end portions of the scroll blades. 4,558,997, Cl. 418-55.000.

Sakurada, Masahiko: *See*—
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, 4,558,946, Cl. 356-73.000.

Salas, Edward R.: *See*—
Boudreau, Daniel A.; Salas, Edward R.; and Sandini, James M., 4,559,595, Cl. 364-200.000.

Samifi Babcock, S.p.A.: *See*—
La Monica, Gaspare, 4,558,573, Cl. 62-473.000.

Samofal, Sergei V.: *See*—
Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Sampson, John L.: *See*—
Ludman, Jacques E.; Sampson, John L.; and Caulfield, Henry J., 4,558,951, Cl. 356-346.000.

Sandberg, Lars; and Scheuer, Bjorn, to AB Volvo. Turbo charged combustion engine with water injection. 4,558,665, Cl. 123-25.00C.
Sanderson, Roger S.; and Whelchel, Robert C. Sterilized storage container. 4,558,632, Cl. 92-14.000.
Sandini, James M.: *See*—
Boudreau, Daniel A.; Salas, Edward R.; and Sandini, James M., 4,559,595, Cl. 364-200.000.
Sandoz Ltd.: *See*—
Bennett, Brian; and Clough, Donald K., 4,559,058, Cl. 8-496.000.
Sano, Shoichi: *See*—
Furukawa, Yoshimi; Sano, Shoichi; and Takamatsu, Hiroshi, 4,558,877, Cl. 280-91.000.
Sano, Susumu: *See*—
Nomura, Yoshika; Sano, Susumu; and Shoji, Sadahiro, 4,559,103, Cl. 162-160.000.
Sano, Yoshikazu: *See*—
Komuro, Isaku; Mori, Hideyasu; and Sano, Yoshikazu, 4,559,417, Cl. 179-99.0LS.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.
Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A.: *See*—
Ramasco, Carlo, 4,558,491, Cl. 19-215.000.
Santrade Ltd.: *See*—
Froeschke, Reinhard, 4,559,000, Cl. 425-6.000.
Sanwa Seiki Mfg., Co., Ltd.: *See*—
Koyanagi, Yuzo, 4,558,679, Cl. 123-502.000.
Sara Lee Corporation: *See*—
Horton, Gilbert L.; Poole, Eddie D.; and Foreman, John W., Jr., 4,558,653, Cl. 112-262.200.
Sara, Raymond V., to Union Carbide Corporation. Oxidation prohibitive coatings for carbonaceous articles. 4,559,270, Cl. 428-408.000.
Saravalle, Carlo: *See*—
Munari, Fausto; Ostan, Giovanni; Saravalle, Carlo; Tosi, Bruno; and Trestianu, Sorin, 4,559,063, Cl. 55-67.000.
Sari, Hikmet, to U.S. Philips Corporation. Auto-adaptive amplitude-equalizing arrangement for digital radio links. 4,559,635, Cl. 375-14.000.
Sasaki, Shosaku; Kaiya, Nobuo; and Shirahata, Akihiko, to Toray Silicone Company, Ltd. Peellable film-forming organopolysiloxane compositions. 4,559,396, Cl. 528-15.000.
Sasaya, Hideaki: *See*—
Oshiro, Takao; Fukami, Akira; and Sasaya, Hideaki, 4,558,634, Cl. 98-2.180.
SASIB S.p.A.: *See*—
Cristiani, Athos, 4,558,778, Cl. 198-471.100.
Sassmannshausen, Knut O. Lighting fixture with a concave reflector, such as a tail, warning or signal light etc. 4,559,589, Cl. 362-305.000.
Sato, Eiji: *See*—
Arigaya, Hideto; Katsui, Yoshihiro; Sumiyoshi, Kikuo; Sato, Eiji; and Miyasaka, Kingo, 4,559,249, Cl. 428-36.000.
Sato, Noriya: *See*—
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,559,279, Cl. 428-632.000.
Sato, Shigenori: *See*—
Shimode, Shinichi; and Sato, Shigenori, 4,559,255, Cl. 428-138.000.
Sato, Shigeru: *See*—
Betsudan, Shinichi; Aoki, Katsuhiko; Sato, Shigeru; and Katagi, Takashi, 4,559,540, Cl. 343-761.000.
Sato, Terumi: *See*—
Morinaga, Hiroshi; Miyake, Satoru; and Sato, Terumi, 4,559,166, Cl. 252-512.000.
Sato, Toshihiro; Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble memory device. 4,559,617, Cl. 365-36.000.
Satoh, Yuji, to Diesel Kiki Co., Ltd. Process for the manufacture of solenoid operated valve. 4,558,498, Cl. 29-157.10R.
Sattel, John A., to Spacesaver Corporation. Chain tightener for drive chain. 4,559,027, Cl. 474-116.000.
Saunders, Stephen W.: *See*—
Agrawal, Anil K.; Saunders, Stephen W.; and Weckesser, George J., 4,559,204, Cl. 423-167.000.
Sautter, Helmut, to Robert Bosch GmbH. Electrochromic indicator device assembled with an adhesion promoting layer. 4,558,924, Cl. 350-357.000.
Sawada, Satoru; Fujita, Shinsaku; and Koyama, Koichi, to Fuji Photo Film Co., Ltd. Heat development with reducible dye releaser. 4,559,290, Cl. 430-203.000.
Saylor, David M.: *See*—
Golata, John H.; Saylor, David M.; Egan, William E.; and Goldstein, Arthur A., 4,558,727, Cl. 152-5.000.
Scardilli, A. Vincent; and Levine, Alfred L., to Allied Corporation. Indicator illuminated with electroluminescent lighting. 4,559,582, Cl. 362-23.000.
Schaefer Werke GmbH: *See*—
Meike, Klaus, 4,558,735, Cl. 165-131.000.
Schafer, Georg, to Carl Freudenberg, Firma. Vibration damping clutch disc. 4,558,773, Cl. 192-106.100.
Schaich, Wilbur A., to Centrifugal Piston Expander, Inc. Rotating cylinder engine and method of operating the engine. 4,558,666, Cl. 123-43.00R.
Scharf, Hans-Dieter: *See*—
Kraetz, Udo; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; Scharf, Hans-Dieter; and Frauenrath, Herbert, 4,559,355, Cl. 514-383.000.
Schartz, Charles O., to Pickle Creek Mfg., Inc. Multi-port hydraulic swivel. 4,558,890, Cl. 285-13.000.
Schaub, Erwin L.: *See*—
Viola, Frank J.; Schaub, Erwin L.; Sharp, Bernard C.; and Evans, Raymond J., 4,558,994, Cl. 417-295.000.
Scherf, Thomas W.: *See*—
LaBarge, Robert L.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,558,775, Cl. 194-4.00C.
Schering Aktiengesellschaft: *See*—
Nickisch, Klaus; Laurent, Henry; Esperling, Peter; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,559,331, Cl. 514-173.000.
Schering Corporation: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; and Patel, Naginbhai M., 4,559,333, Cl. 514-192.000.
Neustadt, Bernard R.; Andrews, David R.; and McNamara, Paul E., 4,559,340, Cl. 514-222.000.
Scheuer, Bjorn: *See*—
Sandberg, Lars; and Scheuer, Bjorn, 4,558,665, Cl. 123-25.00C.
Schickaneder, Helmut; Morsdorf. Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., to Ludwig Heumann & Co. GmbH. Pyridine-pyrimidinone derivatives, a process for their production and H_2-antagonist medicament containing these compounds. 4,559,344, Cl. 514-269.000.
Schiller, Karl H.: *See*—
Schilling, Lothar; and Schiller, Karl H., 4,558,654, Cl. 112-298.000.
Schilling, Lothar; and Schiller, Karl H., to Pfaff Industriemaschinen GmbH. Under bed thread trimmer with thread detector stop motion. 4,558,654, Cl. 112-298.000.
Schlicht, Raymond C., to Texaco Inc. Friction-reducing molybdenum salts and process for making same. 4,559,152, Cl. 252-32.70E.
Schlosser, Guenther: *See*—
Klever, Manfred; and Schlosser, Guenther, 4,558,559, Cl. 56-16.400.
Schlotter, Nicholas E.; and Rabolt, John F., to International Business Machines Corporation. Translation/rotation positioning device. 4,559,447, Cl. 250-231.0SE.
Schmeichel, Steven D.: *See*—
Wagner, Wayne M.; Schmeichel, Steven D.; and Bethke, Timothy A., 4,558,891, Cl. 285-322.000.
Schmelzle, Carl W.: *See*—
Lapke, James A.; and Schmelzle, Carl W., 4,559,421, Cl. 200-51.100.
Schmitt, Reinhold; Herbert, Manfred; and Baur, Walter, to Rovema Verpackungsmaschinen GmbH. Conveyor apparatus, in particular for use in packaging plants. 4,558,779, Cl. 198-627.000.
Schoen, Hans. Gripper feed system for blanking presses or the like. 4,558,809, Cl. 226-162.000.
Schols, John A.; and Yu, Keechung, to Dow Chemical Company, The. Low styrene emission vinyl ester resin for fiber-reinforced applications. 4,559,375, Cl. 523-449.000.
Schoolman, Arnold. Stereoscopic remote viewing system. 4,559,555, Cl. 358-88.000.
Schott, Lawrence A.: *See*—
Schott, Roger A.; and Schott, Lawrence A., 4,559,516, Cl. 340-73.000.
Schott, Roger A.; and Schott, Lawrence A., to Freedom Industries, Inc. Helmet with turn signal indicators. 4,559,516, Cl. 340-73.000.
Schouten, Henry G.: *See*—
Buzby, George C., Jr.; and Schouten, Henry G., 4,559,178, Cl. 260-455.00R.
Schroedel, Helmut; and Nugent, Nancy. Reading aid apparatus, especially a copyholder for typewriters. 4,558,527, Cl. 40-343.000.
Schultz, Moses R. Hoop chair. 4,558,904, Cl. 297-441.000.
Schultz, Steven C., to Bofors Nobel, Inc. Highly stable dichlorobenzidine dihydrochloride slurry and a method for preparing such. 4,559,160, Cl. 252-182.000.
Schutsky, Vitaly I.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.
Schutten, Herman P., to Eaton Corporation. Continuously variable transmission. 4,558,567, Cl. 60-544.000.
Schwartz, David M., to CompuSonics Corporation. Magnetic storage system. 4,559,570, Cl. 360-77.000.
Scolastico, Carlo: *See*—
Gomarasca, Piero; Scolastico, Carlo; and Sirtori, Cesare, 4,559,345, Cl. 514-275.000.
Scrantom, Dehart G., to AVX Corporation. Method for filling printed circuif boards. 4,558,514, Cl. 29-838.000.
Seahorse Equipment Corporation: *See*—
Blandford, Joseph W., 4,558,973, Cl. 405-216.000.
Sealright Co., Inc.: *See*—
Richards, Frank P., 4,558,813, Cl. 229-4.500.
Sears, I. Weir: *See*—
Hostetler, John E.; Hulsebusch, William H.; and Sears, I. Weir, 4,559,094, Cl. 156-212.000.
Sears, Lawrence M.; and Slaby, Terrance C., to Adams Manufacturing Company. Electrostatic air cleaner and high voltage power source therefor. 4,559,594, Cl. 363-126.000.
Sears Manufacturing Company: *See*—
Hostetler, John E.; Hulsebusch, William H.; and Sears, I. Weir, 4,559,094, Cl. 156-212.000.

Sears, Roebuck & Co.: *See*—
Gall, John C., 4,558,861, Cl. 272-73.000.
Sebestyen, Bela: *See*—
Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, 4,558,748, Cl. 175-57.000.
Secom Co., Ltd.: *See*—
Tani, Kozaburo; and Watanabe, Tsutomu, 4,559,526, Cl. 340-539.000.
See, Jacques L. Wall construction prefabricated from interconnectable modules. 4,558,549, Cl. 52-220.000.
Seed, Aniese E., to Toledo Transducers, Inc. Cantilever support beam assembly for a load cell and the like. 4,558,756, Cl. 177-211.000.
Seidl, Jiri, to Bayerische Motoren Werke AG. Two-cylinder, four-stroke-cycle, double-piston engine, especially air-flow-cooled for motorcycles. 4,558,676, Cl. 123-432.000.
Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,559,601, Cl. 364-475.000.
Sekida, Minoru: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,558,939, Cl. 354-416.000.
Sekino, Takeo; and Takeda, Masashi, to Sony Corporation. Latched comparator circuit. 4,559,522, Cl. 340-347.0AD.
Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Bujatti, Marina; and Cetronio, Antonio, 4,559,238, Cl. 427-82.000.
Selick, Barbara: *See*—
Nusbaum, Arthur, 4,558,546, Cl. 52-221.000.
Seliga, Gerald W. Pistol grips with counterbalancing platforms. 4,558,533, Cl. 42-71.00P.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,559,552, Cl. 357-58.000.
Senju Pharmaceutical Co., Ltd.: *See*—
Oka, Yoshikazu, 4,559,361, Cl. 514-620.000.
Sennett, Thomas; and Guetschow, Jimmy L., to Beloit Corporation. Positive lock foil blades. 4,559,105, Cl. 162-352.000.
Sentoku, Hideshi; and Uematsu, Yoshiaki, to Laurel Bank Machine Co., Ltd. Automatic coin depositing and paying machine. 4,558,712, Cl. 133-3.00R.
Senyek, Michael L.; and Kolaczewski, Mitchell S., to Goodyear Tire & Rubber Company, The. Continuous emulsion polymerization process for preparation of flame-retardant latex. 4,559,374, Cl. 523-348.000.
Serracant, Jose-Maria C.; and Serracant, Juan C. Machine for liquid treatment of fabrics. 4,558,575, Cl. 68-181.00R.
Serracant, Juan C.: *See*—
Serracant, Jose-Maria C.; and Serracant, Juan C., 4,558,575, Cl. 68-181.00R.
Seto, Nobuo; Furutachi, Nobuo; Morigaki, Masakazu; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing stabilizer. 4,559,297, Cl. 430-551.000.
Seto, Toshiaki; Yamamoto, Hideo; and Kobayashi, Yoshiji, to Mikuni Kogyo Kabushiki Kaisha. Variable ve.turi type carburetor. 4,559,185, Cl. 261-41.00D.
Setra Systems, Inc.: *See*—
Lee, Shih-Ying, 4,558,600, Cl. 73-862.640.
Sevald, William T.: *See*—
Vogt, Norman H., 4,558,487, Cl. 17-1.00R.
Sevelinge, Gerard; and Pido, Jean-Claude, to Creusot-Loire. Support structure for solar collector. 4,558,551, Cl. 52-646.000.
Seyerl, Joachim V., to SKW Trostberg. Process for manufacturing guanylurea sulfamate. 4,559,409, Cl. 564-59.000.
Shabram, Lyle F., Jr.: *See*—
Shabram, Lyle F., Sr.; and Shabram, Lyle F., Jr., 4,558,806, Cl. 222-556.000.
Shabram, Lyle F., Sr.; and Shabram, Lyle F., Jr. Condiment cap. 4,558,806, Cl. 222-556.000.
Shaffer, Robert H. Holder for vise parallels. 4,558,856, Cl. 269-277.000.
Shaffer, Roy E.: *See*—
Gleason, James R.; Shaffer, Roy E.; and Awabdy, Issac A., 4,559,377, Cl. 524-44.000.
Shah, Ajay: *See*—
Rowe, William; Dooley, Thomas; and Shah, Ajay, 4,559,401, Cl. 544-216.000.
Shah, Ashwin V.: *See*—
Bass, Leland J.; Quick, Roy F., Jr.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,559,533, Cl. 340-724.000.
Shahidi, Fereidoon: *See*—
Rubin, Leon J.; Diosady, Levente L.; Shahidi, Fereidoon; and Wood, Darrell F., 4,559,234, Cl. 426-250.000.
Sharp, Bernard C.: *See*—
Viola, Frank J.; Schaub, Erwin L.; Sharp, Bernard C.; and Evans, Raymond J., 4,558,994, Cl. 417-295.000.
Sharp Kabushiki Kaisha: *See*—
Itoh, Masataka; and Katoh, Shohichi, 4,559,564, Cl. 358-293.000.
Miyamae, Ryuichi; and Yasuda, Haruo, 4,558,707, Cl. 128-683.000.
Takeuji, Koichi, 4,559,428, Cl. 219-10.55D.
Shaw, Robert A., Jr.: *See*—
Shaw, Robert A., Sr.; and Shaw, Robert A., Jr., 4,558,583, Cl. 72-389.000.
Shaw, Robert A., Sr.; and Shaw, Robert A., Jr. Mobile pipe bending carriage. 4,558,583, Cl. 72-389.000.
Shell, Francis J., to Phillips Petroleum Company. Workover fluid. 4,559,149, Cl. 252-8.55R.
Shell Oil Company: *See*—
Jackson, Roy J., 4,559,395, Cl. 528-102.000.
Langner, Carl G., 4,558,972, Cl. 405-169.000.
Slaugh, Lynn H., 4,559,321, Cl. 502-263.000.
Shelly, James E., to Keystone Lamp Mfg. Corp. Non-rotatable telescoping support structure. 4,558,893, Cl. 285-354.000.
Shepherd, Wayne P.: *See*—
Suarez, Jose I.; Irwin, James S.; and Shepherd, Wayne P., 4,559,505, Cl. 331-1.00A.
Sherrill, Jimmy L.: *See*—
Howard, H. Keith; and Sherrill, Jimmy L., 4,559,412, Cl. 174-138.00J.
Shihabi, David S., to Mobil Oil Corporation. Zeolite activation. 4,559,314, Cl. 502-71.000.
Shimada, Shigeru: *See*—
Kubota, Yuichi; Nishimatsu, Masaharu; and Shimada, Shigeru, 4,559,265, Cl. 428-336.000.
Shimano Industrial Company Limited: *See*—
Morimoto, Shinichi, 4,558,828, Cl. 242-7.190.
Shimizu, Akihiko: *See*—
Inoue, Kiyoshi; Shimizu, Akihiko; and Yabe, Jinzo, 4,558,977, Cl. 409-80.000.
Shimizu, Kazufusa: *See*—
Minato, Hideo; Fujisaki, Tadashi; Shimizu, Kazufusa; and Koyanagi, Yoshiharu, 4,559,073, Cl. 71-9.000.
Shimizu, Kiyoshi: *See*—
Hayashi, Ikuo; Ogihara, Keizo; Itikawa, Tadao; and Shimizu, Kiyoshi, 4,559,172, Cl. 260-112.50R.
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicular automatic speed change gear assembly. 4,558,612, Cl. 74-844.000.
Shimode, Shinichi; and Sato, Shigenori, to Hitachi, Ltd. Acoustical absorbing material. 4,559,255, Cl. 428-138.000.
Shinkai, Masaru: *See*—
Aramaki, Jun; and Shinkai, Masaru, 4,559,433, Cl. 219-69.00W.
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, to Nihon Tokushu Noyaku Seizo K.K. Substituted phenylsulfonyl guanidine herbicides and intermeditates therefor. 4,559,079, Cl. 71-92.000.
Shirahata, Akihiko: *See*—
Sasaki, Shosaku; Kaiya, Nobuo; and Shirahata, Akihiko, 4,559,396, Cl. 528-15.000.
Shiraiwa, Michitaka: *See*—
Hasegawa, Shumpei; and Shiraiwa, Michitaka, 4,558,682, Cl. 123-589.000.
Shirakawa, Kenzo: *See*—
Yamamoto, Shigeo; Tanimizu, Makoto; Shirakawa, Kenzo; and Wataya, Hideji, 4,559,456, Cl. 307-66.000.
Shiraki, Yasuhiro; Murayama, Yoshimasa; Katayama, Yoshifumi; and Maruyama, Eiichi, to Hitachi, Ltd. Semiconductor device. 4,559,547, Cl. 357-23.200.
Shirakura, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling exhaust system of internal-combustion engine. 4,558,566, Cl. 60-314.000.
Shively, Richard R.: *See*—
Robinson, William V., Jr.; and Shively, Richard R., 4,559,609, Cl. 364-784.000.
Shoji, Michihiro; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Drilling machine. 4,559,577, Cl. 361-31.000.
Shoji, Sadahiro: *See*—
Nomura, Yoshika; Sano, Susumu; and Shoji, Sadahiro, 4,559,103, Cl. 162-160.000.
Shores, Marvin W., to General Dynamics Pomona Division. Cable shield to connector termination device. 4,558,918, Cl. 339-143.00R.
Showa Denko K.K.: *See*—
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Shtandel, Stanislav K.: *See*—
Kulesh, Vladimir P.; Moskalik, Leonid M.; Orlov, Anatoly A.; Blizniuk, Jury A.; and Shtandel, Stanislav K., 4,558,952, Cl. 356-349.000.
Shtrikman, Shmuel; and Danziger, Menachem. Compressor unit in split cycle cryogenic coolers. 4,558,570, Cl. 62-6.000.
Shung, Wu-Shi: *See*—
Hwang, Eddie Y.; Shung, Wu-Shi; and Osborne, Robert L., 4,558,569, Cl. 60-657.000.
Shuzuki, Shigeki: *See*—
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Siefert, Gerhard: *See*—
Fischer, Alfred; Freimuth, Claus; Gerlach, Roland; and Siefert, Gerhard, 4,558,985, Cl. 415-74.000.
Siegfried, Peter; Brunner, Gerd; and Stutzer, Dieter, to Siegfried, Peter. Process for separating liquids from fine grained solids. 4,559,133, Cl. 208-177.000.
Sieglen, Rolf A.: *See*—
Freund, Hans-Ulrich; Heide, Wolfgang M.; and Sieglen, Rolf A., 4,558,752, Cl. 175-207.000.
Siemens Aktiengesellschaft: *See*—
Detterbeck, Max; and Dummler, Emil, 4,558,894, Cl. 289-1.500.
Franetzki, Manfred; Gagneur, Klaus; and Prestele, Karl, 4,559,077, Cl. 604-151.000.
Kohlmuller, Hans; and Nippe, Waldemar, 4,559,165, Cl. 252-512.000.
Krec, Zdenek, 4,559,504, Cl. 337-194.000.
Lorenz, Dieter; and Olsen, Willi, 4,559,424, Cl. 200-146.00R.
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Siemon Company, The: *See—*
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SIG Schweizerische Industrie-Gesellschaft: *See—*
Steiner, Heinz; and Knoll, Fritz, 4,558,852, Cl. 267-137.000.
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Watkins, Randy W.; Bell, Robert J.; Martorano, Joseph A.; and Essinger, Walter F., 4,559,535, Cl. 340-793.000.
Signetics Corporation: *See—*
Hiujsing, Johan H., 4,559,502, Cl. 330-294.000.
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Klaus, Artur F., 4,558,811, Cl. 227-116.000.
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Silverton Tannery Limited: *See—*
Roets, Sarel D., 4,559,146, Cl. 210-705.000.
Simig, Gyula: *See—*
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.
Simkin, Ernst M.: *See—*
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Simmonds Precision Products, Inc.: *See—*
Ramsdale, Kurt A.; and Harter, Richard M., 4,559,507, Cl. 331-183.000.
Sims, Cecil W.; and Hill, Arthur, to Sundstrand Corporation. Voltage regulator with independent peak and average voltage sensing. 4,559,487, Cl. 322-24.000.
Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,559,347, Cl. 514-300.000.
Sintef: *See—*
Erga, Olav, 4,559,212, Cl. 423-243.000.
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Gomarasca, Piero; Scolastico, Carlo; and Sirtori, Cesare, 4,559,345, Cl. 514-275.000.
Skach, Edward J., Jr.; and Cobel, George B., to Dow Chemical Company, The. Salt-coated magnesium granules. 4,559,084, Cl. 75-0.50B.
SKF Kugelagerfabriken GmbH: *See—*
Brandenstein, Manfred; Haas, Roland; and Hans, Rudiger, 4,558,768, Cl. 188-343.000.
SKF Kugellagerfabriken GmbH: *See—*
Gossmann, Willi; Pape, Gebhard; Klupfel, Norbert; Ludwig, Emil; Stark, Josef; Bauer, Bernhard; and Freund, Hans, 4,558,502, Cl. 29-434.000.
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SKF Nova AB: *See—*
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Seyerl, Joachim V., 4,559,409, Cl. 564-59.000.
Skytta, Osmo; and Sailas, Vaino; Sailas, to Valmet OY. Press roll and press in a paper making machine. 4,559,106, Cl. 162-358.000.
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Sears, Lawrence M.; and Slaby, Terrance C., 4,559,594, Cl. 363-126.000.
Slarve, Michael. Safety helmet. 4,559,586, Cl. 362-106.000.
Slaugh, Lynn H., to Shell Oil Company. Process for producing wide pore catalyst supports. 4,559,321, Cl. 502-263.000.
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Marchais, Jean; and Netter, Michel, 4,558,550, Cl. 52-309.700.
Smerbeck, Richard V.; and Pittz, Eugene P., to Warner-Lambert Company. Non-steroidal anti-inflammatory compounds to treat inflammation. 4,559,328, Cl. 514-159.000.
Smith, Harry L. O., to Beattie Systems, Inc. Bright viewing and focusing screens. 4,558,922, Cl. 350-127.000.
Smith, James A.; and Reilly, James E., to Creative Products Resource Associates, Ltd. Cosmetic applicator useful for skin moisturizing. 4,559,157, Cl. 252-90.000.
Smith, Paul D.; and Martin, Joel L., to Phillips Petroleum Company. Supported vanadium dihalide-ether complex catalyst. 4,559,318, Cl. 502-110.000.
Smith, Ronald J.: *See—*
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Snook, Craig W.: *See—*
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Snyder, Daniel R.: *See—*
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Snyder Laboratories, Inc.: *See—*
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Societe Anonyme de Recherche et d'Etudes Techniques: *See—*
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Societe Anonyme d'Explosifs et de Produits Chimiques: *See—*
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Societe Manzoni-Bouchot: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See—*
Bouiller, Jean G.; and Soligny, Marcel R., 4,558,564, Cl. 60-39.161.
Societe Nationale Industrielle et Aerospatiale: *See—*
Mens, Jacques M. N.; Barnoin, Pierre; and Martin, Michel J. L., 4,558,837, Cl. 244-108.000.
Societe pour l'Etude et la Fabrication de Circuites Integres Speciaux E.F.C.I.S.: *See—*
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Sokoloff, Boris, to Societe pour l'Etude et la Fabrication de Circuites Integres Speciaux E.F.C.I.S. Symmetrical integrator and application of said integrator to an electric filter. 4,559,498, Cl. 328-127.000.
Sokolov, Alexei V.: *See—*
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Sommer, Herbert; and Wohlfeil, Gerhard, to Jagenberg AG. Device for coating a continuous web. 4,558,658, Cl. 118-411.000.
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Sony Corporation: *See—*
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Amano, Toshio; and Kozakai, Daisuke, 4,559,561, Cl. 358-192.100.
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Hosoya, Mitsuru; Tsuchiya, Takao; and Toyoda, Naokuni, 4,559,558, Cl. 358-162.000.
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Watanabe, Tetsu; and Tanaka, Masato, 4,559,568, Cl. 360-48.000.
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Soucie, William G.: *See—*
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Southern California Edison Company, Inc.: *See—*
Powell, John G., 4,558,656, Cl. 116-147.000.
Southwest Research Corporation: *See—*
Sparks, Cecil R.; Edlund, Carl E.; and Brown, Morton E., 4,559,610, Cl. 364-803.000.
Spacemaker Limited: *See—*
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Spacesaver Corporation: *See—*
Sattel, John A., 4,559,027, Cl. 474-116.000.
Spalten, Robert. Osteoblastic stimulation implant. 4,558,701, Cl. 128-419.00F.
Sparks, Cecil R.; Edlund, Carl E.; and Brown, Morton E., to Southwest Research Corporation. Gas pumping system analog. 4,559,610, Cl. 364-803.000.
Sparre, Preben C.: *See—*
Logstrup, Jorgen; and Sparre, Preben C., 4,559,413, Cl. 174-163.00R.
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Latta, Joseph E., Jr., 4,559,518, Cl. 340-130.000.
Speck, F. James. Electrical cable reel. 4,558,833, Cl. 242-110.100.
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Spencer, William; and Jackovich, Melvin C., to Sundstrand Corporation. Detector for shorted rotating diode of a brushless alternator. 4,559,486, Cl. 322-99.000.
Spensley, Robert H.: *See—*
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Sperry Corporation: *See—*
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Spiegel, Erwin: *See—*
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Spigarelli, Donald J.: *See—*
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Spitzer, Hermann: *See—*
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Spivack, John D.; and Pastor, Stephen D., to Ciba Geigy Corporation. 4-Hydroxyphenylthio substituted stabilizers for polymers. 4,559,379, Cl. 524-289.000.
Spoor, Herbert: *See—*
Heil, Guenter; Spoor, Herbert; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; Balz, Werner; and Lehner, August, 4,559,118, Cl. 204-159.140.
Spranger, Douglas M.: *See—*
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Nickell, Louis G.; and Stach, Leonard J., 4,559,080, Cl. 71-92.000.
Stahlecker, Fritz; and Lang, Kurt, to Stahlecker, Hans; and Stahlecker, Fritz. Spinning aggregate for wrapped yarn. 4,558,562, Cl. 57-18.000.
Stahlecker, Hans: *See—*
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Standard Oil Company, The: *See—*
Mazanec, Terry J.; and Frye, John G., Jr., 4,559,316, Cl. 502-73.000.
Paspek, Stephen C., Jr., 4,559,127, Cl. 208-8.0LE.
Yellig, WilliaM F., Jr., 4,558,740, Cl. 166-272.000.
Standard Oil Company (Indiana): *See—*
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Stark, Josef: *See—*
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Stark, William C. Paint shield holder and shielding method. 4,559,245, Cl. 427-282.000.
Stasiek, Jan S.; and Deyhimy, Ira, to J. S. Technology, Inc. Digital indicating torque wrench. 4,558,601, Cl. 73-862.230.
Stauber, Siegfried T., to Wyler AG. Air bearing body. 4,558,909, Cl. 308-5.00R.
Stauffer Chemical Co.: *See—*
Felix, Raymond A.; and Hsu, Joanna K., 4,559,082, Cl. 71-98.000.
Giolito, Silvio L.; and Mirviss, Stanley B., 4,559,184, Cl. 260-974.000.
Nutter, Robert C.; and Panganiban, Lucy C., 4,559,308, Cl. 435-317.000.
Telschow, Jeffrey E., 4,559,405, Cl. 549-240.000.
Ste Look: *See—*
Guitel, Jean-Claude; and le Faou, Daniel, 4,558,884, Cl. 280-620.000.
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., to Steck Manufacturing Co., Inc. Mechanism for checking three-dimensional bodies. 4,558,521, Cl. 33-533.000.
Steck, Laurence D.: *See—*
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 4,558,521, Cl. 33-533.000.
Steck Manufacturing Co., Inc.: *See—*
Steck, George L.; Steck, Raymond E.; and Steck, Laurence D., 4,558,521, Cl. 33-533.000.
Steck, Raymond E.: *See—*
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Steelcase Inc.: *See—*
Kolk, Stephen B., 4,558,553, Cl. 52-829.000.
Steer, Peter L., to Craig Medical Products Limited. Coupling for an ostomy bag. 4,559,048, Cl. 604-338.000.
Steiner, Heinz; and Knoll, Fritz, to SIG Schweizerische Industrie-Gesellschaft. Vibration damper with linearly reciprocating mass. 4,558,852, Cl. 267-137.000.
Stemmle, Denis J., to Xerox Corporation. Single pivot bin sorter. 4,558,860, Cl. 271-293.000.
Stenman, Ulf-Hakan; and Huhtala, Marja-Liisa. Diagnostic method using oncofetal peptide as a tumor marker. 4,559,311, Cl. 436-542.000.
Stephan, George P., to Kollmorgen Technologies Corporation. Control systems for AC induction motors. 4,559,485, Cl. 318-802.000.
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Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., to University of Utah Research Foundation. Apparatus and methods for minimizing peritoneal injection catheter obstruction. 4,559,033, Cl. 604-49.000.
Stephens, John A.; and Stephens, Martin. Non-fogging mirror. 4,558,929, Cl. 350-588.000.
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Stephens, John A.; and Stephens, Martin, 4,558,929, Cl. 350-588.000.
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Stinebaugh, Donald E. Supercharged engine. 4,558,671, Cl. 123-317.000.
Stokes, Vijay K., to General Electric Company. Molded commutator and method of manufacture. 4,559,464, Cl. 310-233.000.
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Bergthaller, Peter; Rosenhahn, Lothar; Herd, Karl J.; Fuerstenwerth, Hauke; and Stolzenburg, Rudolf, 4,559,296, Cl. 430-519.000.
Stork PMT B.V.: *See—*
van Mil, Martinus P. G., 4,558,489, Cl. 17-52.000.
Storni, Angelo, to Ciba Geigy Corporation. Carboxamides. 4,559,349, Cl. 514-318.000.
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Stoss, Peter; and Leitold, Matyas, to Heinrich Mack Nachf. Dihydropyridine derivatives of 1,4:3,6-dianhydrohexitols. 4,559,351, Cl. 514-338.000.
Straub, Gerald J. Fluid circuit means for elevating the rear end of an air ride truck trailer. 4,558,886, Cl. 280-711.000.
Strauss, Werner, to Klockner-Humboldt-Deutz AG. Short, broad jigging machine, particularly for finest grain sizing of minerals. 4,559,135, Cl. 209-455.000.
Streif AG: *See—*
Meicki, Gerhard, 4,558,968, Cl. 403-174.000.
Streit, Dwight C.: *See—*
Allen, Frederick G.; Streit, Dwight C.; and Metzger, Robert A., 4,559,091, Cl. 148-174.000.
Strickland, Wilbur C., Jr.: *See—*
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Strohl, Roderick G., Jr.: *See—*
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Sturdivan, James R., to Hallmark Cards, Inc. Multi-leaved tablet and method of forming same. 4,558,980, Cl. 412-2.000.
Stutz, Herbert: *See—*
Tesch, Helmut; Henne, Andreas; Heym, Manfred; and Stutz, Herbert, 4,559,398, Cl. 528-94.000.
Stutzer, Dieter: *See—*
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Su, Kai C., to Ciba-Geigy Corporation. Tinted contact lenses and a method for their preparation. 4,559,059, Cl. 9-507.000.
Suarez, Jose I.; Irwin, James S.; and Shepherd, Wayne P., to Motorola, Inc. Frequency synthesizer with improved priority channel switching. 4,559,505, Cl. 331-1.00A.
Suda, Kazuyoshi: *See—*
Hoshino, Yuji; Endou, Hajime; and Suda, Kazuyoshi, 4,558,568, Cl. 60-641.500.
Sudo, Takeshi: *See—*
Uehara, Makoto; Sudo, Takeshi; and Kanatani, Fujio, 4,558,949, Cl. 356-152.000.
Suenaga, Kazuyuki, to Victor Company of Japan, Ltd. FM demodulating circuit having an insensitive frequency point. 4,559,566, Cl. 358-342.000.
Sugawara, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sampling circuit. 4,559,457, Cl. 307-352.000.
Sugimoto, Hiroyuki: *See—*
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Sugiyama, Yasunori: *See—*
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Sumitomo Light Metal Industries, Ltd.: *See—*
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Sumitomo Metal Industries, Ltd.: *See—*
Hiraoka, Bunsho; Tanaka, Tsutomu; and Okane, Koji, 4,559,062, Cl. 48-92.000.
Sumiyoshi, Kikuo; and Miyasaka, Kingo, to Oiles Industry Co., Ltd. Sliding member. 4,559,248, Cl. 428-36.000.

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Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Kido, Keishiro; Iijima, Toshio; and Nozaki, Nobuharu, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 4,559,289, Cl. 430-66.000.
Sunahara, Kimihisa: *See*—
Kirita, Yasuzo; Kawahashi, Masaru; Kariu, Keiki; Sunahara, Kimihisa; and Naito, Hidemune, 4,559,034, Cl. 604-52.000.
Sunaoka, Seiichi. Multi-bobbin wire coiling machine and jig mounting mechanism therefor. 4,558,835, Cl. 242-7.090.
Sundman, Frey, to A. Ahlstrom Osakeyhtio. Process for washing fibre stock. 4,558,477, Cl. 8-156.000.
Sundstrand Corporation: *See*—
Glennon, Timothy F., 4,559,593, Cl. 363-41.000.
Lutfy, Gary J., 4,559,580, Cl. 361-385.000.
Sims, Cecil W.; and Hill, Arthur, 4,559,487, Cl. 322-24.000.
Spencer, William; and Jackovich, Melvin C., 4,559,486, Cl. 322-99.000.
Supp, Emil: *See*—
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Suzuhiro U.S.A., Inc.: *See*—
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Suzuki, Hajime: *See*—
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Suzuki, Hideo: *See*—
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Suzuki, Hirosuke, to Junkosha Company Ltd. Resin material in sheet form. 4,559,254, Cl. 428-131.000.
Suzuki Iron Works Co., Ltd.: *See*—
Suzuki, Masakazu, 4,558,854, Cl. 269-93.000.
Suzuki, Junpei: *See*—
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Suzuki, Keizo: *See*—
Ninomiya, Ken; Nishimatsu, Shigeru; Suzuki, Keizo; Okudaira, Sadayuki; and Ogawa, Yoshifumi, 4,559,100, Cl. 156-345.000.
Suzuki, Kenji, to Canon Kabushiki Kaisha. Focus detecting system using light from an imaging optical system for focus detection. 4,559,446, Cl. 250-204.000.
Suzuki, Masakazu, to Suzuki Iron Works Co., Ltd. Step block. 4,558,854, Cl. 269-93.000.
Suzuki, Masato, to Sumtak Corporation. Rotary encoder. 4,559,524, Cl. 340-347.00P.
Suzuki, Ryo: *See*—
Sato, Toshihiro; Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Sugita, Yutaka, 4,559,617, Cl. 365-36.000.
Swearingen, Loren L.; Heinsohn, Alfred W.; Snook, Craig W.; Embrey, Wallace E.; and McConchie, Garnet E., to Dow Chemical Company, The. Acetophenone recovery and purification. 4,559,110, Cl. 203-37.000.
Sweet, Richard C.: *See*—
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,559,280, Cl. 428-633.000.
Sweet, Welby C., to Marathon Oil Company. Process for devolatilizing natural gas liquids. 4,559,070, Cl. 62-17.000.
Synthelabo: *See*—
Bigg, Dennis; and Menin, Jacques, 4,559,356, Cl. 514-401.000.
Porges, Etienne, 4,559,053, Cl. 604-408.000.
Szabo, Tibor: *See*—
Wiedenhofer, Heinrich; and Szabo, Tibor, 4,559,001, Cl. 425-114.000.
Szalvay, Laszlo: *See*—
Kruger, Franz J.; and Szalvay, Laszlo, 4,559,283, Cl. 429-174.000.
Szelenyi, Istvan: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Postius, Stefan; Szelenyi, Istvan; Herter, Rolf; Hansen, Herbert; and Ahrens, Kurt H., 4,559,344, Cl. 514-269.000.
Szenbanyak, Mecseki: *See*—
Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, 4,558,748, Cl. 175-57.000.
Szodfridt, Imre, to Dr. Ing. h.c.F. Porsche A.G. Gear-type change-speed transmission for motor vehicles. 4,558,607, Cl. 74-339.000.
Tachikawa Spring Co., Ltd.: *See*—
Natori, Takashi, 4,558,905, Cl. 297-452.000.
Takagi, Genziro, 4,558,903, Cl. 297-408.000.
Yokoyama, Sho, 4,558,901, Cl. 297-113.000.
Tada, Akira; and Tanigawa, Koichi, to O-M Limited. Apparatus for folding jacket material. 4,559,030, Cl. 493-252.000.
Tada, Tetsuya; Kawamoto, Kazuyuki; and Yamada, Akihiko, to Canyon Corporation. Trigger-type sprayer with integrally formed housing, trigger, nozzle and cylinder. 4,558,821, Cl. 239-333.000.
Taft-Peirce Supfina Machine Company, Inc.: *See*—
MacLeod, Roderick B.; and Mandeville, Paul J., 4,558,537, Cl. 51-66.000.
Taisei Kensetsu Kabushiki Kaisha: *See*—
Kitamura, Hiroshi; Nishikawa, Kaoru; and Naito, Masamitsu, 4,558,543, Cl. 52-2.000.
Taiyo Fishery Co., Ltd.: *See*—
Aoki, Shigetada; Usui, Masahiko; and Kitano, Kojuro, 4,558,572, Cl. 62-378.000.
Takagi, Genziro, to Tachikawa Spring Co., Ltd. Angle adjustment device of a movable body for a vehicle seat. 4,558,903, Cl. 297-408.000.
Takahashi, Akira; Matsui, Kenji; and Suzuki, Hajime, to Jeco Company Limited. Stepping motor. 4,559,461, Cl. 310-49.00R.
Takahashi, Kotei, to Nissan Motor Co., Ltd. Shift control mechanism of an automotive manual transmission. 4,558,610, Cl. 74-473.00R.
Takahashi, Susumu: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,559,295, Cl. 430-325.000.
Takahashi, Toshihiko: *See*—
Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Morihisa, 4,559,060, Cl. 44-23.000.
Takamatsu Electric Works, Ltd.: *See*—
Ishigure, Masao; Ota, Mitsuo; Takaoka, Naotoshi; and Kudomi, Mitsuharu, 4,559,530, Cl. 340-664.000.
Takamatsu, Hiroshi: *See*—
Furukawa, Yoshimi; Sano, Shoichi; and Takamatsu, Hiroshi, 4,558,877, Cl. 280-91.000.
Takamiya, Bonnosuke: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,558,612, Cl. 74-844.000.
Takamiya, Shigeo; and Furuta, Toshio, to Mitsui Kensetsu Kabushiki Kaisha. Shield machine. 4,558,906, Cl. 299-31.000.
Takamiya, Takehisa: *See*—
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, 4,558,964, Cl. 400-144.100.
Takaoka, Naotoshi: *See*—
Ishigure, Masao; Ota, Mitsuo; Takaoka, Naotoshi; and Kudomi, Mitsuharu, 4,559,530, Cl. 340-664.000.
Takase, Hiroaki: *See*—
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, 4,558,964, Cl. 400-144.100.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,559,334, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-Substituted-3-vinyl-3-cephem compounds and processes for production of the same. 4,559,334, Cl. 514-202.000.
Takayama, Shinji: *See*—
Kumasaka, Noriyuki; Fujiwara, Hideo; Otomo, Shigekazu; Yamashita, Takeo; Takayama, Shinji; Saito, Noritoshi; Kobayashi, Nobuo; and Kudo, Mitsuhiro, 4,559,572, Cl. 360-110.000.
Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko; and Kitada, Chieko, 4,559,324, Cl. 514-14.000.
Okutani, Tetsuya; and Goto, Giichi, 4,559,177, Cl. 260-396.00R.
Takeda, Masashi: *See*—
Sekino, Takeo; and Takeda, Masashi, 4,559,522, Cl. 340-347.0AD.
Takeda Riken Co., Ltd.: *See*—
Yada, Eiichi, 4,559,521, Cl. 340-347.0NT.
Takei, Katsumori; and Nakamura, Haruo, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal composition. 4,559,161, Cl. 252-299.630.
Takeshita, Masatoshi: *See*—
Sato, Toshihiro; Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Sugita, Yutaka, 4,559,617, Cl. 365-36.000.
Takeshita, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Maximum demand meter. 4,559,494, Cl. 324-103.00R.
Takeuchi, Jimmy S.: *See*—
Vacanti, David C.; Read, John C.; and Takeuchi, Jimmy S., 4,559,489, Cl. 333-1.100.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Ishizuka, Masaaki, 4,559,362, Cl. 514-674.000.
Takeuchi, Toshio: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,559,295, Cl. 430-325.000.
Takeuji, Koichi, to Sharp Kabushiki Kaisha. Oven door with integral choke mechanism and microwave absorber. 4,559,428, Cl. 219-10.55D.
Takezawa, Keiji, to Alps Electric Co., Ltd. Slide type variable resistor assembly and method of producing same. 4,559,515, Cl. 338-128.000.
Taki, Hiromitsu: *See*—
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,559,279, Cl. 428-632.000.
Tamamura, Toshiaki; and Niwa, Osamu, to Nippon Telegraph & Telephone. Electrically conducting polymer film and method of manufacturing the same. 4,559,112, Cl. 204-12.000.
Tamaru, Shigemi: *See*—
Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, 4,559,423, Cl. 200-144.00R.
Tamplen, Jack W., to Otis Engineering Corporation. Pulling tool. 4,558,895, Cl. 294-86.180.
Tamura, Atuyoshi: *See*—
Nakashima, Hiroyuki; Tamura, Atuyoshi; Kanbara, Yoichi; and Fujii, Masaharu, 4,559,268, Cl. 428-397.000.
Tamura, Kazuhisa; Iida, Kazumi; and Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Vibration damper assembly. 4,559,024, Cl. 464-63.000.

Tanaka, Fujio: *See*—
Tanaka, Shinsuke; Tanaka, Fujio; Nagao, Yasuyuki; Imamura, Nobutake; and Ota, Chuichi, 4,559,573, Cl. 360-131.000.

Tanaka, Kunio: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,559,601, Cl. 364-475.000.

Tanaka, Masato: *See*—
Watanabe, Tetsu; and Tanaka, Masato, 4,559,568, Cl. 360-48.000.

Tanaka, Nobuyoshi: *See*—
Hashimoto, Seiji; and Tanaka, Nobuyoshi, 4,559,559, Cl. 358-167.000.

Tanaka, Norihiko: *See*—
Murakami, Katsuo; Yamazaki, Hitoshi; Tanaka, Norihiko; and Ito, Hiroshi, 4,559,470, Cl. 313-487.000.

Tanaka, Shigenori; and Tomita, Kouji, to Nissan Motor Co., Ltd. Sensor for controlling the supply of weft yarn or the like. 4,558,723, Cl. 139-452.000.

Tanaka, Shinsuke; Tanaka, Fujio; Nagao, Yasuyuki; Imamura, Nobutake; and Ota, Chuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,559,573, Cl. 360-131.000.

Tanaka, Takashi: *See*—
Ikuta Yoshiaki; and Tanaka, Takashi, 4,558,711, Cl. 133-3.00F.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Accessory carrying type starting motor. 4,559,455, Cl. 290-38.00R.

Tanaka, Toshinori: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.

Tanaka, Tsutomu: *See*—
Hiraoka, Bunsho; Tanaka, Tsutomu; and Okane, Koji, 4,559,062, Cl. 48-92.000.

Tani, Keizo; and Ogasawara, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of producing a semiconductor device. 4,558,510, Cl. 29-588.000.

Tani, Kozaburo; and Watanabe, Tsutomu, to Secom Co., Ltd. Security alarm system. 4,559,526, Cl. 340-539.000.

Tanigawa, Koichi: *See*—
Tada, Akira; and Tanigawa, Koichi, 4,559,030, Cl. 493-252.000.

Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Flash photography system. 4,558,939, Cl. 354-416.000.

Taniguchi, Yousuke: *See*—
Yamasaki, Syuichi; Yamaguchi, Hiroshi; and Taniguchi, Yousuke, 4,559,200, Cl. 420-492.000.

Tanimizu, Makoto: *See*—
Yamamoto, Shigeo; Tanimizu, Makoto; Shirakawa, Kenzo; and Wataya, Hideji, 4,559,456, Cl. 307-66.000.

Tanimoto, Koji: *See*—
Nosaki, Takefumi; Tanimoto, Koji; and Hosoya, Masahiro, 4,558,941, Cl. 355-3.0DD.

Tanimoto, Masahiro: *See*—
Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,559,201, Cl. 422-63.000.

Tanimura, Keizo: *See*—
Kasuga, Takuzo; Ikenaga, Yukio; Yamawaki, Masami; and Tanimura, Keizo, 4,559,380, Cl. 524-317.000.

Tanner, Douglas J., to General Signal Corporation. Valve actuator coupling. 4,558,605, Cl. 74-102.000.

Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, to Asaki Kogaku Kogyo Kabushiki Kaisha. Manual aperture value setting circuit for camera. 4,558,940, Cl. 354-455.000.

Tapia, Graciano J.; and Martinez, Oscar G., to Alcudia, Empresa Para la Industrria Quimica, S.A. Polymeric covering materials for growing plants or crops. 4,559,381, Cl. 524-405.000.

Tar, Csaba: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.

Tasi, Laszlo : *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.

Tassoff, James A.: *See*—
Chandra, Grish; Kohl, Gretchen S.; and Tassoff, James A., 4,559,227, Cl. 424-70.000.

Tassone, Joseph V.; and Candor, James T., to Dayco Corporation. Method for making a layer of reinforced polymeric material. 4,559,188, Cl. 264-24.000.

Tateishi, Mitsuru: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.

Tausheck, Russell. Apparatus for cutting laminated glass. 4,558,622, Cl. 83-885.000.

Tayco Developments, Inc.: *See*—
Taylor, Douglas P., 4,558,767, Cl. 188-282.000.

Taylor, Douglas P., to Tayco Developments, Inc. Fluid amplified shock absorber with rebound stiffening construction. 4,558,767, Cl. 188-282.000.

TBL Development Corporation: *See*—
Towns, Edward J.; and Brown, Edward M., 4,558,794, Cl. 215-250.000.

TDK Corporation: *See*—
Kubota, Yuichi; Nishimatsu, Masaharu; and Shimada, Shigeru, 4,559,265, Cl. 428-336.000.

Technics GmbH Europa: *See*—
Liebel, Gerhard; and Kegel, Bert, 4,559,099, Cl. 156-345.000.

Teepak, Inc.: *See*—
Martinek, Thomas W., 4,558,488, Cl. 17-41.000.

Teitel, Sidney: *See*—
Bruderer, Hans; Kierstead, Richard W.; Mullin, John G., Jr.; Nakamura, Keiji; Tateishi, Mitsuru; Teitel, Sidney; and O'Brien, Jay P., 4,559,403, Cl. 546-144.000.

Tektronix, Inc.: *See*—
Griffith, Joseph W., 4,559,437, Cl. 219-86.210.

Teldix GmbH: *See*—
Auer, Werner, 4,558,604, Cl. 74-5.440.

Telefonaktiebolaget LM Ericsson: *See*—
Roos, Sture G.; Fagerstedt, Nils U. H.; and Pehrson, Jens E., 4,559,624, Cl. 370-56.000.

Telefunken electronic GmbH: *See*—
Minner, Willy; Spies, Heinz-Hermann; and Domland, Christoph, 4,558,675, Cl. 123-427.000.

Telschow, Jeffrey E., to Stauffer Chemical Company. Process for preparing substituted phthalic anhydrides. 4,559,405, Cl. 549-240.000.

Temnikov, Eduard M.: *See*—
Trishevsky, Igor S.; Patseka, Ivan E.; Temnikov, Eduard M.; Borisenko, Alexandr G.; Doktorov, Mark E.; Kheifets, Grigory R.; Lanko, Vladimir V.; and Miroshnichenko, Sergei V., 4,558,577, Cl. 72-12.000.

Tempo Sanys: *See*—
Caumont, Jean-Francois, 4,558,619, Cl. 83-685.000.

TenEyck, Monika O.: *See*—
Kasprzyk, Martin R.; and TenEyck, Monika O., 4,559,244, Cl. 427-227.000.

Teramachi, Hiroshi. Linear slide roller bearing unit. 4,558,910, Cl. 308-6.00C.

Teranishi, Takao: *See*—
Nishimura, Yutaka; Kuroiwa, Hiroshi; Oyama, Yoshishige; and Teranishi, Takao, 4,558,678, Cl. 123-494.000.

Tesch, Helmut; Henne, Andreas; Heym, Manfred; and Stutz, Herbert, to BASF Aktiengesellschaft. Curable epoxy resins. 4,559,398, Cl. 528-94.000.

Tetra Pak Developpement SA: *See*—
Nilsson, Erling I., 4,559,257, Cl. 428-152.000.

Tetra Pak International AB: *See*—
Cetrelli, Renato, 4,559,259, Cl. 428-167.000.
Lagerstedt, Jan. E. R.; and Andersson, Helge, 4,559,068, Cl. 55-399.000.

Texaco Inc.: *See*—
Ashrawi, Samir S.; and Prukop, Gabriel, 4,559,148, Cl. 252-8.55D.
Huang, Wann-Sheng; and Brown, Alfred, 4,558,742, Cl. 166-278.000.
Jahnke, Frederick C.; Crouch, William B.; and Gulko, George M., 4,559,061, Cl. 48-63.000.
Schlicht, Raymond C., 4,559,152, Cl. 252-32.70E.

Texas Instruments Incorporated: *See*—
Dromsky, John A.; and Zenuk, Charles H., 4,559,089, Cl. 148-11.50Q.
Hochschild, James R., 4,559,634, Cl. 375-9.000.

Tezuka, Yoshitomo, to Aida Engineering Ltd. Concrete reinforcing steel fibers. 4,559,276, Cl. 428-399.000.

Thallinger, Daniel J. Foldable composite panel including means for rendering it rigid. 4,559,253, Cl. 428-65.000.

Theilig, Arthur W.; and Poplis, John, to Marmon Group, Inc., The. Egg holding flat. 4,558,661, Cl. 119-43.000.

Theis, Peter F.; and Buchberger, Gregory D., to Morgan Industries, Inc. Telephone line activity monitor. 4,559,416, Cl. 179-7.10R.

Tholen, Leo: *See*—
Aretz, Ulrich; Knors, Herbert; Maassen, Wilhelm; Reiners, Franz-Josef; and Tholen, Leo, 4,558,829, Cl. 242-35.50A.

Thomas & Betts Corporation: *See*—
Greenwood, William S., 4,558,915, Cl. 339-97.00C.

Thomas, Dean G.; and Kopnicky, Robert J., to Bethlehem Steel Corporation. Contact thermocouple assembly. 4,558,959, Cl. 374-141.000.

Thomson-Brandt: *See*—
Otsuki, Zenju; and Inami, Mamoru, 4,559,569, Cl. 360-65.000.

Thomson-CGR: *See*—
Caugant, Jean; and Stephan, Guy, 4,559,641, Cl. 378-181.000.

Thomson-CSF: *See*—
Bursztejn, Jacques; and Part, Michel, 4,559,499, Cl. 329-50.000.
Duret, Robert; and Henry, Dominique, 4,559,474, Cl. 315-3.600.
Hetyei, Joseph; and Letocquart, Bruno, 4,559,538, Cl. 343-412.000.
Le Guen, Jacques; Delair, Jacques; and Plessis, Andre , 4,559,640, Cl. 378-113.000.
Val, Christian, 4,559,579, Cl. 361-220.000.
van Cang, Luc P., 4,559,553, Cl. 358-10.000.

Thrush, Roger L.: *See*—
Coller, James R.; and Thrush, Roger L., 4,558,912, Cl. 339-64.00M.

Ti Russell Hobbs Limited: *See*—
Marchant, David J., 4,558,640, Cl. 99-307.000.

Tiwari, Sandip, to International Business Machines Corporation. Method for fabricating a gallium arsenide semiconductor device. 4,558,509, Cl. 29-576.00B.

Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Ink jet recording device modular frame. 4,559,543, Cl. 346-140.00R.

Tohyama, Atsuko: *See*—
Nishimura, Shigeoki; Fujita, Kazunori; Sugimoto, Hiroyuki; Tohyama, Atsuko; Ebato, Noboru; and Matsuda, Shinpei, 4,559,284, Cl. 429-213.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Nunokawa, Kazuo, 4,558,932, Cl. 351-206.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aida, Satoshi; and Itoh, Ayao, 4,558,709, Cl. 128-719.000.
Iizuka, Tetsuya; and Hara, Hisashi, 4,559,548, Cl. 357-23.600.
Komuro, Isaku; Mori, Hideyasu; and Sano, Yoshikazu, 4,559,417, Cl. 179-99.0LS.
Matsumoto, Hiroshi; Ishikawa, Yuji; and Nakamine, Chosin, 4,559,519, Cl. 340-286.00M.
Sakata, Hirotsugu; and Nagatomo, Shigemi, 4,558,997, Cl. 418-55.000.
Sugawara, Tsutomu, 4,559,457, Cl. 307-352.000.
Tani, Keizo; and Ogasawara, Masahiro, 4,558,510, Cl. 29-588.000.
Yoshikawa, Ryoichi, 4,559,603, Cl. 364-491.000.
Toledo Transducers, Inc.: *See*—
Seed, Aniese E., 4,558,756, Cl. 177-211.000.
Toma, Hitoshi: *See*—
Hirooka, Masaaki; Toma, Hitoshi; and Kondo, Hideyo, 4,559,260, Cl. 428-215.000.
Tomisawa, Norio; and Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Effect imparting device in an electronic musical instrument. 4,558,624, Cl. 84-1.260.
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, to Hitachi Chemical Company, Ltd. Process for regenerating solution for developing or peeling alkali-type photosensitive film. 4,559,295, Cl. 430-325.000.
Tomita, Kouji: *See*—
Tanaka, Shigenori; and Tomita, Kouji, 4,558,723, Cl. 139-452.000.
Tomoda, Tetsuya: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.
Tong, Po: *See*—
Berlekamp, Elwyn R.; and Tong, Po, 4,559,625, Cl. 371-2.000.
Topfl, Rosemarie: *See*—
Abel, Heinz; and Topfl, Rosemarie, 4,559,162, Cl. 252-321.000.
Topfl, Werner: *See*—
Maier, Ludwig; Meyer, Willy; Oertle, Konrad; Roloff, Achim; and Topfl, Werner, 4,559,078, Cl. 71-87.000.
Toray Industries, Inc.: *See*—
Katsuki, Kosuke; and Murakami, Yukihiro, 4,559,010, Cl. 432-59.000.
Uemura, Tadahiro; and Kurihara, Masaru, 4,559,139, Cl. 210-490.000.
Toray Silicone Company, Ltd.: *See*—
Sasaki, Shosaku; Kaiya, Nobuo; and Shirahata, Akihiko, 4,559,396, Cl. 528-15.000.
Toro Company, The: *See*—
Horner, Herbert F., Jr.; Zenner, Michael M.; Nowack, Daniel P.; and Christopherson, Herman P., 4,558,558, Cl. 56-11.300.
Toshiba Silicone Co., Ltd.: *See*—
Endo, Isao; and Kuniya, Joji, 4,559,387, Cl. 525-102.000.
Kurita, Akitsugu; and Fujimoto, Tetsuo, 4,559,319, Cl. 502-156.000.
Tosi, Bruno: *See*—
Munari, Fausto; Ostan, Giovanni; Saravalle, Carlo; Tosi, Bruno; and Trestianu, Sorin, 4,559,063, Cl. 55-67.000.
Toth, Istvan: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.
Towns, Edward J.; and Brown, Edward M., to TBL Development Corporation. Container with vessel for retention of telltales. 4,558,794, Cl. 215-250.000.
Toyo Seikan Kaisha Limited: *See*—
Matsuno, Kenji; and Kuse, Kazuma, 4,559,431, Cl. 219-64.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Nomura, Akihiko; and Fujii, Masahiko, 4,559,384, Cl. 524-612.000.
Toyoda Gosei Co., Ltd.: *See*—
Nagata, Masanori, 4,558,900, Cl. 296-152.000.
Toyoda, Naokuni: *See*—
Hosoya, Mitsuru; Tsuchiya, Takao; and Toyoda, Naokuni, 4,559,558, Cl. 358-162.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Habu, Nobuo; Osawa, Kouichi; Kato, Yuuichi; Furuhashi, Michio; Kawai, Taiyo; Saiki, Junichi; Ito, Toshio; and Nakamura, Tsutomu, 4,559,599, Cl. 364-424.100.
Motoda, Masanori; Fujikawa, Atsunobu; Shuzuki, Shigeki; Suzuki, Junpei; and Nojima, Masahiro, 4,559,252, Cl. 428-57.000.
Traber, Walter: *See*—
Gehret, Jean-Claude; and Traber, Walter, 4,559,357, Cl. 514-423.000.
Tradebest International Corporation: *See*—
Ku, Ming-ho, 4,559,583, Cl. 362-32.000.
Treharne, Richard W.; McKibben, Charlton K.; and Moles, Donald R., to Battelle Development Corporation. Arc reactor for fertilizer manufacture. 4,559,206, Cl. 422-186.240.
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Rudich, George, Jr.; and Troup, David L., 4,559,441, Cl. 219-364.000.
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Kopf, Peter W.; and Merriam, Charles N., 4,559,247, Cl. 427-386.000.
Sara, Raymond V., 4,559,270, Cl. 428-408.000.
Union Oil Company of California: *See*—
Young, Donald C., 4,559,076, Cl. 71-29.000.
Unisearch Limited: *See*—
Robinson, Vivian N. E.; and Cutmore, Nicholas G., 4,559,450, Cl. 250-310.000.
United Conveyor Corporation: *See*—
Margison, Elwood R., 4,558,805, Cl. 222-133.000.
United Kingdom Atomic Energy Authority: *See*—
Roach, Peter F.; Duncombe, Edward; and Hulse, Ian, 4,559,436, Cl. 219-85.00M.
U.S. Currency Protection Corp.: *See*—
Bernhardt, Terry L., 4,559,529, Cl. 340-571.000.
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Administrator, National Aeronautics and Space Administration: *See*—
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Adamski, Joseph A., 4,559,217, Cl. 423-299.000.
Fenwick, James R.; and Chang, Yi M., 4,558,597, Cl. 73-600.000.
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Long, Richard L., 4,559,101, Cl. 156-359.000.
Murphy, John W.; and Vail, David K., 4,559,613, Cl. 364-703.000.
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,559,175, Cl. 260-349.000.
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Barditch, Irving F., 4,558,467, Cl. 2-2.10R.
Casseday, Michael W.; Berg, Norman J.; and Filipov, Andree N., 4,558,925, Cl. 350-358.000.
F'Geppert, Erwin, 4,558,606, Cl. 74-193.000.
Overman, David L.; and Konick, William L., 4,559,419, Cl. 200-5.00R.
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Cahen, David; and Chen, Yih W., 4,559,282, Cl. 429-111.000.
Friedman, Lewis; Buehler, Robert J.; Matthew, Michael W.; and Ledbetter, Myron, 4,559,096, Cl. 156-272.200.
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Berry, Robert F., Jr., 4,558,585, Cl. 73-1.0DV.
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Hoffman, Craig A.; Meyer, Jerry R.; and Bartoli, Filbert, 4,558,923, Cl. 350-354.000.
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Almgren, Per H. I.; and Durne, Christian H. P., 4,559,585, Cl. 362-92.000.
Beckmann, Friedrich K.; Dotsch, Horst; and Gossel, Dieter, 4,559,467, Cl. 313-359.100.
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Kroontje, Wiggert, 4,559,471, Cl. 313-553.000.
Sari, Hikmet, 4,559,635, Cl. 375-14.000.
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Johnson, Bruce V.; and Guile, Roy N., 4,559,628, Cl. 372-104.000.
Kisling, Douglas L.; Hill, Edward C.; and Delahoussaye, Ronald D., 4,558,988, Cl. 416-220.00R.
Unitika Limited: *See*—
Nagai, Tadao; and Echigo, Yoshiaki, 4,559,216, Cl. 423-531.000.
Universal Skate Sharpeners Ltd.: *See*—
Consay, Joseph A., 4,558,541, Cl. 51-281.00R.
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Allen, Frederick G.; Streit, Dwight C.; and Metzger, Robert A., 4,559,091, Cl. 148-174.000.
University of Oklahoma, The Board of Regents for the: *See*—
McInerney, Michael J.; Jenneman, Gary E.; Knapp, Roy M.; and Menzie, Donald E., 4,558,739, Cl. 166-246.000.
University of Scranton: *See*—
Joyce, Patrick J., 4,558,690, Cl. 128-1.00R.
University of Utah: *See*—
Ryan, Norman W.; and Peperakis, Angelo, Jr., 4,558,743, Cl. 166-303.000.
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Stephen, Robert L.; Kablitz, Carl; Hanover, Barry K.; Jacobsen, Stephen C.; and Harrow, Jeffrey J., 4,559,033, Cl. 604-49.000.
Urszin nee Simon, Eszter: *See*—
Balogh, Karoly; Nagy, Jozsef; Pinter, Zoltan; Tar, Csaba; Toth, Istvan; Grega nee Toth, Erzsebet; Dombay, Zsolt; Pasztor, Karoly; Urszin nee Simon, Eszter; and Tasi, Laszlo , 4,559,083, Cl. 71-100.000.
USM Corporation: *See*—
Freeman, Gary T.; Maxner, Richard B.; and Nash, Thomas F., 4,558,983, Cl. 414-331.000.
Giebel, Gerhard, 4,558,478, Cl. 12-81.000.
Peck, Douglas J.; and Spigarelli, Donald J., 4,558,524, Cl. 34-78.000.
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Aoki, Shigetada; Usui, Masahiko; and Kitano, Kojuro, 4,558,572, Cl. 62-378.000.
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Mularie, William M., 4,559,121, Cl. 204-192.00R.
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Vacanti, David C.; Read, John C.; and Takeuchi, Jimmy S., to Boeing Company, The. Low-loss radio frequency multiple port variable power controller. 4,559,489, Cl. 333-1.100.
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Val, Christian, to Thomson CSF. Device for the protection of an electronic component and/or circuit against the disturbances (voltages) generated by an external electromagnetic field. 4,559,579, Cl. 361-220.000.
Valeo: *See*—
Despres, Dominique, 4,558,771, Cl. 192-70.180.
Pitoiset, Didier, 4,559,026, Cl. 474-14.000.
Valmet OY: *See*—
Skytta, Osmo; and Sailas, Vaino; Sailas, 4,559,106, Cl. 162-358.000.
Van Buren, Phillip D.: *See*—
Abt, Edgar J.; Van Buren, Phillip D.; and Witter, James P., 4,559,525, Cl. 340-347.00P.
van Cang, Luc P., to Thomson-CSF. Device and apparatus for the selective acquisition of signals, particularly television signals, with a view to their characterization by a digital computer. 4,559,553, Cl. 358-10.000.
Van Gemert, Barry, to PPG Industries, Inc. Sulfamoyl urea derivatives. 4,559,081, Cl. 71-93.000.
van Hauten, Hartmut: *See*—
Bachmann, Rainer; and van Hauten, Hartmut, 4,558,618, Cl. 83-438.000.
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., to International Flavors & Fragrances Inc. Use of macrocyclic lactone in augmenting or enhancing aroma or taste of consumable materials. 4,559,168, Cl. 252-522.00A.
van Mil, Martinus P. G., to Stork PMT B.V. Method and apparatus for dividing slaughtered poultry into a back half and a front half. 4,558,489, Cl. 17-52.000.
Van Zeeland, Anthony J.; Larson, Willis A.; and Christensen, David A., to Oak Industries Inc. Membrane switch and components having means for preventing creep. 4,559,426, Cl. 200-159.00B.
Varian Associates, Inc.: *See*—
Davidson, Christopher D., 4,559,590, Cl. 363-21.000.
Fruzzetti, Paul R., 4,558,587, Cl. 73-40.700.
Garrett, Charles B., 4,558,984, Cl. 414-609.000.
Vaughn, Howard A., Jr.: *See*—
Doin, James E.; and Vaughn, Howard A., Jr., 4,559,271, Cl. 428-412.000.
VDO Adolf Schindling AG: *See*—
Nickol, Friedrich-Wilhelm, 4,559,534, Cl. 340-754.000.
Veeder Industries, Inc.: *See*—
Dolson, Richard G.; and Brophy, William R., 4,559,427, Cl. 200-159.00B.
Veneziale, Lee E., to Westvaco Corporation. Longitudinal tenderizing of veneer. 4,558,725, Cl. 144-362.000.
Venkateswaran, Viswanathan: *See*—
Kim, Jonathan J.; and Venkateswaran, Viswanathan, 4,559,312, Cl. 501-1.000.
Versace, Richard W.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; and Patel, Naginbhai M., 4,559,333, Cl. 514-192.000.
Victor Company of Japan, Limited: *See*—
Kuwahata, Toshikatsu; Kawabata, Fumio; and Kurosawa, Genzo, 4,559,584, Cl. 362-86.000.
Miyaji, Naotaka; Sakamoto, Atsushi; and Iwahara, Makoto, 4,559,642, Cl. 381-92.000.
Suenaga, Kazuyuki, 4,559,566, Cl. 358-342.000.
Umeda, Hiroyuki, 4,559,574, Cl. 360-132.000.
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Gergo, Gyorgy; Nemeth, Jozsef; Sebestyen, Bela; and Vida, Zoltan, 4,558,748, Cl. 175-57.000.

Villegas, Pedro: *See*—
Page, Robert K.; Villegas, Pedro; Eidson, Caswell S.; and Gaudry, Daniel, 4,559,229, Cl. 424-89.000.

Vilutis & Co., Inc.: *See*—
Vilutis, Leonard J., 4,558,801, Cl. 220-404.000.

Vilutis, Leonard J., to Vilutis & Co., Inc. Conforming liner. 4,558,801, Cl. 220-404.000.

Viola, Frank J.; Schaub, Erwin L.; Sharp, Bernard C.; and Evans, Raymond J., to Parker-Hannifin Corporation. Dual stage air compressor. 4,558,994, Cl. 417-295.000.

Vlastnik, Arthur F.: *See*—
Daw, David E.; and Vlastnik, Arthur F., 4,558,892, Cl. 285-331.000.

Vock, Manfred H.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,559,168, Cl. 252-522.00A.

Vogt, Hans: *See*—
Kloppe, Herbert; Spiegel, Erwin; and Vogt, Hans, 4,559,274, Cl. 428-594.000.

Vogt, Norman H., to Sevald, William T. Apparatus for processing similar workpieces of varying shape, points of contour and dimension. 4,558,487, Cl. 17-1.00R.

Volling, Gudrun: *See*—
Jorns, Peter; Meyer, Norbert; Rausch, Werner; Rothkegel, Josef; Luckhardt, Gunther; and Volling, Gudrun, 4,559,087, Cl. 148-6.15Z.

vom Stein, Karl: *See*—
Vossieck, Paul; and vom Stein, Karl, 4,558,872, Cl. 277-88.000.

Vortex Innerspace Products, Inc.: *See*—
Dockery, Denzel J., 4,559,136, Cl. 210-169.000.

Vossieck, Paul; and vom Stein, Karl, to Goetze AG. Slide ring seal assembly with novel compression spring. 4,558,872, Cl. 277-88.000.

Vossoughi, Sohrab: *See*—
Gysling, Peter; and Vossoughi, Sohrab, 4,559,031, Cl. 493-410.000.

Votel, Thomas W., to Comp Equipment Corporation. Safety enclosure for disposable hypodermic syringe needle. 4,559,042, Cl. 604-192.000.

Vrielink, Hendrik, to U.S. Philips Corporation. Sorting device for data words. 4,559,612, Cl. 364-900.000.

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Gritsuk, Lev D.; Gorbik, Anatoly S.; Golod, Leonid D.; Kutsykovich, Dorina B.; Bashinsky, Kazimir D.; Samofal, Sergei V.; Peftiev, Igor M.; Bogoditsa, Viktor P.; Kulagin, Alexandr N.; Goryainov, Gennady E.; Bannikov, Jury G.; Liderman, Semen M.; Nikolaev, Georgy V.; Mischenko, Vitaly N.; Gromenko, Valentin V.; Kamardin, Alexei M.; and Kobets, Nikolai S., 4,559,011, Cl. 432-233.000.

Vukovich, William J.: *See*—
Grimes, Michael R.; and Vukovich, William J., 4,558,772, Cl. 192-0.076.

W. Haking Enterprises Limited: *See*—
Winter, Arthur J., 4,558,934, Cl. 354-21.000.

W. R. Grace & Co.: *See*—
Guthrie, James L.; Roberts, Helen F.; and Lundsager, Christian B., 4,559,373, Cl. 523-220.000.

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Aretz, Ulrich; Knors, Herbert; Maassen, Wilhelm; Reiners, Franz-Josef; and Tholen, Leo, 4,558,829, Cl. 242-35.50A.

Wachi, Kaoru. Material for accident protecting clothes with connected tile-like small nylon plates. 4,559,251, Cl. 428-53.000.

Wachs, Israel E.; Fiato, Rocco A.; and Chersich, Claudio C., to Exxon Research and Engineering Co. Iron carbide on titania surface modified with group VA oxides as Fisher-Tropsch catalysts. 4,559,365, Cl. 518-717.000.

Wacker-Chemie GmbH: *See*—
Huhn, Karl; and Ullrich, Kurt, 4,559,385, Cl. 524-838.000.

Wada, Seiji: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.

Wagner, Arno: *See*—
John, Willy; Klimaschka, Norbert; Wagner, Arno; and Meyer, Gunther, 4,558,825, Cl. 241-171.000.

Wagner, Wayne M.; Schmeichel, Steven D.; and Bethke, Timothy A., to Donaldson Company, Inc. Clamp for exhaust system. 4,558,891, Cl. 285-322.000.

Wagnieres, Willy: *See*—
Haour, Georges; Richter, Dag; and Wagnieres, Willy, 4,559,187, Cl. 264-11.000.

Wakita, Toshiaki, to Sony Corporation. Analog to digital converter. 4,559,523, Cl. 340-347.0AD.

Walker, Brian: *See*—
Hunter, George S.; Walker, Brian; and Merrie, Kenneth, 4,559,066, Cl. 55-274.000.

Walker, Donald R.: *See*—
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,558,470, Cl. 2-414.000.

Wallbridge, William L.: *See*—
Hazenbroek, Jacobus E.; and Wallbridge, William L., 4,558,490, Cl. 17-52.000.

Wallis, Bernard J. Punch retainer. 4,558,620, Cl. 83-698.000.

Wallis, Bernard J. Corrugated strip tray. 4,558,784, Cl. 206-561.000.

Walton, Frank A.; and Perrinet, Paul M., to Kowatachi International, Ltd. Apparatus for injecting measured quantities of liquid into a fluid stream. 4,558,715, Cl. 137-99.000.

Wambach, Allen D.: *See*—
Kostelnik, Robert J.; and Wambach, Allen D., 4,559,164, Cl. 252-511.000.

Wang, Cheng-Chung. Inflatable toy with movable mechanism. 4,559,020, Cl. 446-232.000.

Wang, David W.; and Draney, Daniel R., to American Cyanamid Company. Polymer from aromatic diamine and N,N,N',N'-tetraglycidyl-1,3-propylene bis(p-aminobenzoate). 4,559,400, Cl. 528-327.000.

Wang, Tsing-Chow; and Josephs, Richard M., to Sperry Corporation. High gain non-linear threshold input Josephson junction logic circuit. 4,559,459, Cl. 307-462.000.

Wardlaw, Stephen C. Method and apparatus for measuring blood constituent counts. 4,558,947, Cl. 356-39.000.

Warner-Lambert Company: *See*—
Butler, Donald E., 4,559,358, Cl. 514-424.000.
Smerbeck, Richard V.; and Pittz, Eugene P., 4,559,328, Cl. 514-159.000.

Wartenbergh, Robert P.: *See*—
Noto, Sal J.; and Wartenbergh, Robert P., 4,559,575, Cl. 360-133.000.

Wasson, George E., to Conoco Inc. Control of froth flotation separation. 4,559,134, Cl. 209-166.000.

Wasson, Ken G.: *See*—
Petersen, Christian C.; and Wasson, Ken G., 4,558,937, Cl. 354-234.100.

Watanabe, Akihiro: *See*—
Kito, Kuniji; Watanabe, Akihiro; and Mori, Shigeo, 4,559,414, Cl. 174-196.000.

Watanabe, Hiroshi; and Izumi, Eiki, to Hitachi Construction Machinery Co., Ltd. Failure detection system for hydraulic pumps. 4,558,593, Cl. 73-168.000.

Watanabe, Noboru; Oyama, Motofumi; and Kubo, Yoichiro, to Nippon Zeon Co., Ltd. Method for preventing degradation and deterioration of vulcanized rubber material. 4,559,390, Cl. 525-349.000.

Watanabe, Shojiro: *See*—
Mitsuo, Hirofumi; Watanabe, Shojiro; and Saeki, Keiso, 4,559,242, Cl. 427-150.000.

Watanabe, Shuichi: *See*—
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, 4,558,964, Cl. 400-144.100.

Watanabe, Tetsu; and Tanaka, Masato, to Sony Corporation. Apparatus for re-recording a digital signal on a record medium and for reproducing the same therefrom. 4,559,568, Cl. 360-48.000.

Watanabe, Tsutomu: *See*—
Tani, Kozaburo; and Watanabe, Tsutomu, 4,559,526, Cl. 340-539.000.

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Hashimoto, Mitsuo; Watanabe, Yasuo; Mama, Fumio; and Odan, Akinori, 4,559,007, Cl. 431-4.000.

Wataya, Hideji: *See*—
Yamamoto, Shigeo; Tanimizu, Makoto; Shirakawa, Kenzo; and Wataya, Hideji, 4,559,456, Cl. 307-66.000.

Watkins, Randy W.; Bell, Robert J.; Martorano, Joseph A.; and Essinger, Walter F., to Sigmatron Nova, Inc. System for displaying information with multiple shades of a color on a thin-film EL matrix display panel. 4,559,535, Cl. 340-793.000.

Weber, Harold J. Tamper proof digital value accumulator and display method and apparatus. 4,559,637, Cl. 377-24.000.

Weckesser, George J.: *See*—
Agrawal, Anil K.; Saunders, Stephen W.; and Weckesser, George J., 4,559,204, Cl. 423-167.000.

Wegener, Joseph B., II. Method of manufacturing simulated animal or fish skin. 4,559,189, Cl. 264-39.000.

Wehinger, Egbert; Kazda, Stanislav; and Knorr, Andreas, to Bayer Aktiengesellschaft. Antihypertensive tetrahydropyridine 3-cyano 5-carboxylic acid esters. 4,559,350, Cl. 514-332.000.

Weidemann, Lutz: *See*—
Hiller, Heinz; Supp, Emil; Marschner, Friedemann; Kupfer, Hans; and Weidemann, Lutz, 4,559,207, Cl. 422-197.000.

Weilerstein, I. Marvin: *See*—
McBrearty, Michael; Negin, Michael; Weilerstein, I. Marvin; and Zielenski, Albert J., 4,558,596, Cl. 73-588.000.

Weitgenant, George D.: *See*—
Bouma, James R., 4,558,883, Cl. 280-478.00A.

Welker, Thomas; Carl, Klaus; and Czarnojan, Wolfram, to U.S. Philips Corporation. Green emitting phosphor and cathode-ray tube provided with such a phosphor. 4,559,469, Cl. 313-468.000.

Wellcome Australia Limited: *See*—
Chappell, Anthony G., 4,558,989, Cl. 417-44.000.

Werber, Fred. Working device for dress patterns in the form of a template. 4,558,519, Cl. 33-14.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Bosshard, Werner, 4,558,628, Cl. 89-198.000.

Werner, Peter: *See*—
Jundt, Werner; Kosak, Wolfgang; and Werner, Peter, 4,559,483, Cl. 318-301.000.

Wertitsch, Werner: *See*—
Rock, Siegfried; Rainer, Hans-Peter; Herzog, Reinhold; Wertitsch, Werner; Kromus, Gunter; and Kolbl, Fritz, 4,558,638, Cl. 98-88.100.

Westerman, Charles W., to Ford Aerospace & Communications Corporation. Log-periodic leaky transmission line antenna. 4,559,541, Cl. 343-792.500.

Westinghouse Electric Corp.: *See*—
Basnett, Robert T.; and Bratkowski, Walter V., 4,559,511, Cl. 335-132.000.

Bluzer, Nathan; and Lampe, Donald R., 4,559,638, Cl. 377-60.000.
Hwang, Eddie Y.; Shung, Wu-Shi; and Osborne, Robert L., 4,558,569, Cl. 60-657.000.

Westvaco Corporation: *See—*
Veneziale, Lee E., 4,558,725, Cl. 144-362.000.

Wevers, Jean; Halas, Linda A.; and Peltre, Philippe R., to Procter & Gamble Company, The. Stable liquid detergents containing anionic surfactant and monosulfonated brightener. 4,559,169, Cl. 252-543.000.

Weymeersch, Alain: *See—*
Moore, Jean-Pierre; Winand, Rene ; Weymeersch, Alain; and Renard, Lucien, 4,559,123, Cl. 204-206.000.

Whelchel, Robert C.: *See—*
Sanderson, Roger S.; and Whelchel, Robert C., 4,558,632, Cl. 92-14.000.

Whitaker, Lew: *See—*
Neuman, Eli; and Whitaker, Lew, 4,558,482, Cl. 15-97.00R.

White, Francis R.: *See—*
Kinney, Wayne I.; Koburger, Charles W., III; Lasky, Jerome B.; Nesbit, Larry A.; Troutman, Ronald R.; and White, Francis R., 4,558,508, Cl. 29-571.000.

White, Leonard A.: *See—*
Cabernoch, James L.; and White, Leonard A., 4,558,792, Cl. 215-11.00R.

Whitehouse, Craig M.; Snyder, Daniel R.; and Luther, Ronald B., to DRS Infusion Systems, Inc.; and Luther Medical Products, Inc. Assembly with septum fitting for connecting adaptor and fluid tube. 4,559,043, Cl. 604-201.000.

Whitey Co.: *See—*
Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., 4,558,874, Cl. 277-112.000.

Wickwire, Ralph O.: *See—*
Bass, Leland J.; Quick, Roy F., Jr.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,559,533, Cl. 340-724.000.

Wico Corporation: *See—*
Kim, Syng N., 4,558,609, Cl. 74-471.0XY.

Widl, Wolfgang: *See—*
Kirchesch, Heinz-Peter; Nurck, Wilhelm; and Widl, Wolfgang, 4,559,425, Cl. 200-146.00R.

Wiechert, Rudolf: *See—*
Nickisch, Klaus; Laurent, Henry; Esperling, Peter; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,559,331, Cl. 514-173.000.

Wiedenhofer, Heinrich; and Szabo, Tibor, to Flachglas Aktiengesellschaft. Apparatus for sealing the edges of insulating glass panels. 4,559,001, Cl. 425-114.000.

Wiegand, Herbert: *See—*
Distelrath, Heinz D.; Wiegand, Herbert; Rath, Klaus; and Baumer, Klaus, 4,559,008, Cl. 431-63.000.

Wiegers, Wilhelmus J.: *See—*
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,559,168, Cl. 252-522.00A.

Wilbur, Clayton V.: *See—*
Applegate, Steven L.; Molloy, James J.; and Wilbur, Clayton V., 4,558,963, Cl. 400-120.000.

Wilkerson Corporation: *See—*
Null, Robert A.; Laughlin, Lonnie C.; and Goldberg, Michael L., 4,559,065, Cl. 55-161.000.

Wilkins, Vaughn D. System for viewing three dimensional images. 4,559,556, Cl. 358-88.000.

Williams, Brian H.: *See—*
Martens, John A.; and Williams, Brian H., 4,559,382, Cl. 524-535.000.

Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., to Whitey Co. Valve stem packing assembly. 4,558,874, Cl. 277-112.000.

Williams, Peter J.: *See—*
Cogswell, Frederic N.; Hezzell, David J.; and Williams, Peter J., 4,559,262, Cl. 428-294.000.

Williamson, Stanley C., to Amchem Products, Inc. Rust preventatives. 4,559,088, Cl. 148-6.15R.

Wilson, Arthur C., to General Electric Company. Method of assembling a refrigerator. 4,558,503, Cl. 29-446.000.

Winand, Rene : *See—*
Moore, Jean-Pierre; Winand, Rene ; Weymeersch, Alain; and Renard, Lucien, 4,559,123, Cl. 204-206.000.

Windley, William T.: *See—*
Kobsa, Henry; and Windley, William T., 4,559,196, Cl. 264-168.000.

Winter, Arthur J., to W. Haking Enterprises Limited. Camera exposure control system. 4,558,934, Cl. 354-21.000.

Wischusen, Henry, III, to Rock-Tenn Company. Nesting open-top containers for popcorn and the like. 4,558,815, Cl. 229-31.00R.

Witherden, Alan, to Cortinovis S.p.A. Stranding machines. 4,558,563, Cl. 57-266.000.

Withers, James C.: *See—*
Loutfy, Raouf O.; and Withers, James C., 4,559,215, Cl. 423-496.000.

Wittenberg, Mark S.; and Wulff, Virgil W., to Mattel, Inc. Poseable doll head. 4,559,021, Cl. 446-352.000.

Witter, James P.: *See—*
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Wohlfeil, Gerhard: *See—*
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Wohner, Hans J.: *See—*
Diemer, Peter; and Wohner, Hans J., 4,559,210, Cl. 423-237.000.

Wolfram, Leszek J.: *See—*
Bogaty, Herman; Brown, Keith; Loveless, Norman P.; and Wolfram, Leszek J., 4,559,057, Cl. 8-405.000.

Wolfseder, Alfons, to Anton Steinecker Maschinenfabrik GmbH. Heat exchanger having a set of pipes. 4,558,734, Cl. 165-113.000.

Womako Maschinenkonstruktionen GmbH: *See—*
Fabrig, Paul, 4,558,981, Cl. 412-7.000.

Wood, Clayton D.; Garrou, Philip E.; Kohatsu, Iwao; and Gleason, Edward F., to Dow Chemical Company, The. Catalysts having alkoxide-modified supports. 4,559,364, Cl. 518-715.000.

Wood, Darrell F.: *See—*
Rubin, Leon J.; Diosady, Levente L.; Shahidi, Fereidoon; and Wood, Darrell F., 4,559,234, Cl. 426-250.000.

Wood, Prentice J., to Mead Corporation, The. Integral carrying handle for a can carton. 4,558,816, Cl. 229-52.00B.

Woodruff, Frank, to Allied Corporation. Freewheel unit. 4,558,770, Cl. 192-48.600.

Woringer, Theo: *See—*
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, 4,559,275, Cl. 428-596.000.

Wright, Monte S. Rifle benchrest. 4,558,532, Cl. 42-94.000.

Wright State University: *See—*
Petrofsky, Jerrold S., 4,558,704, Cl. 128-423.00R.

Wu, Kent K., to Henry Ford Hospital. Method and apparatus for setting fractures. 4,558,697, Cl. 128-303.00R.

Wu, Wan C., to Monsanto Company. ABS compositions and process for preparing same. 4,559,386, Cl. 525-71.000.

Wulff, Virgil W.: *See—*
Wittenberg, Mark S.; and Wulff, Virgil W., 4,559,021, Cl. 446-352.000.

Wunsch, Richard E. Apparatus for controlling administration of multiple intravenous solutions and medications. 4,559,036, Cl. 604-81.000.

Wyler AG.: *See—*
Stauber, Siegfried T., 4,558,909, Cl. 308-5.00R.

Xerox Corporation: *See—*
Alden, Jerome S., 4,558,659, Cl. 118-653.000.
Chiama, Bernard A., 4,558,942, Cl. 355-14.0SH.
Joiner, Ronald E., Jr., 4,559,563, Cl. 358-260.000.
Kazmaier, Peter M.; Baranyi, Giuseppa; Hsiao, Cheng-Kuo; and Burt, Richard A., 4,559,286, Cl. 430-59.000.
Kramer, Charles J., 4,559,562, Cl. 358-208.000.
McAneney, T. Brian; Loutfy, Rafik O.; Ong, Beng S.; and Popovic, Zoran D., 4,559,287, Cl. 430-59.000.
Patz, Herbert S., 4,558,943, Cl. 355-3.0DD.
Stemmle, Denis J., 4,558,860, Cl. 271-293.000.
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Xontech, Inc.: *See—*
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Yabe, Jinzo: *See—*
Inoue, Kiyoshi; Shimizu, Akihiko; and Yabe, Jinzo, 4,558,977, Cl. 409-80.000.

Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Auxiliary power output device for an internal combustion engine. 4,558,668, Cl. 123-195.00A.

Yabunaka, Kiyoshi: *See—*
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,558,992, Cl. 417-250.000.

Yada, Eiichi, to Takeda Riken Co., Ltd. Calibration of a multi-slope A-D converter. 4,559,521, Cl. 340-347.0NT.

Yaeger, John R.; and Morgan, Robert K., to Raychem Corporation. Self-protecting and conditioning memory metal actuator. 4,559,512, Cl. 337-140.000.

Yamada, Akihiko: *See—*
Tada, Tetsuya; Kawamoto, Kazuyuki; and Yamada, Akihiko, 4,558,821, Cl. 239-333.000.

Yamada, Hiromi: *See—*
Kamono, Takashi; and Yamada, Hiromi, 4,558,917, Cl. 339-143.00R.

Yamada, Shunichi: *See—*
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,559,193, Cl. 264-60.000.

Yamada, Takashi, to Olympus Optical Co., Ltd. Colorimetric method and apparatus. 4,558,953, Cl. 356-409.000.

Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, to Horiba, Ltd. Crucible cassette for automatic apparatus for analyzing metals. 4,559,201, Cl. 422-63.000.

Yamada, Toshiaki, to Alps Electric Co., Ltd. Omnidirectional changeover switch. 4,559,420, Cl. 200-6.00A.

Yamada, Yasuaki: *See—*
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,558,965, Cl. 400-144.200.

Yamagata, Shinji; Tamaru, Shigemi; Fujii, Hiroshi; Suhara, Hideo; Hisatsune, Fumiyuki; Hosogai, Setsuo; and Yamamoto, Kiyomi, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,559,423, Cl. 200-144.00R.

Yamagata, Toshio: *See—*
Moriya, Takeo; Yamagata, Toshio; and Sugiyama, Yasunori, 4,559,293, Cl. 430-271.000.

Yamaguchi, Hiroshi: *See—*
Yamasaki, Syuichi; Yamaguchi, Hiroshi; and Taniguchi, Yousuke, 4,559,200, Cl. 420-492.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.

Yamaji, Hajime; and Kobayashi, Takeshi, to Hayakawa Rubber Co. Ltd. Aqueously-swelling water stopper and a process for stopping water thereby. 4,558,875, Cl. 277-227.000.

Yamamoto, Akio: *See*—
Muroi, Katsumi; Yamamoto, Akio; Nakamura, Yoichi; Takahashi, Toshihiko; and Maruko, Morihisa, 4,559,060, Cl. 44-23.000.

Yamamoto, Hideo: *See*—
Seto, Toshiaki; Yamamoto, Hideo; and Kobayashi, Yoshiji, 4,559,185, Cl. 261-41.00D.

Yamamoto, Kazumasa: *See*—
Mori, Yoshihiro; Yamamoto, Osamu; and Yamamoto, Kazumasa, 4,558,757, Cl. 178-18.000.

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Yamamoto, Osamu: *See*—
Mori, Yoshihiro; Yamamoto, Osamu; and Yamamoto, Kazumasa, 4,558,757, Cl. 178-18.000.

Yamamoto, Shigeo; Tanimizu, Makoto; Shirakawa, Kenzo; and Wataya, Hideji, to Matsushita Electric Works, Ltd. Battery powered electric appliance. 4,559,456, Cl. 307-66.000.

Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,559,334, Cl. 514-202.000.

Yamasaki, Syuichi; Yamaguchi, Hiroshi; and Taniguchi, Yousuke, to Mitsui Mining and Smelting Company, Ltd. High strength and high conductivity copper alloy. 4,559,200, Cl. 420-492.000.

Yamashita, Takeo: *See*—
Kumasaka, Noriyuki; Fujiwara, Hideo; Otomo, Shigekazu; Yamashita, Takeo; Takayama, Shinji; Saito, Noritoshi; Kobayashi, Nobuo; and Kudo, Mitsuhiro, 4,559,572, Cl. 360-110.000.

Yamauchi, Mineo: *See*—
Kutsukake, Masaki; Yamauchi, Mineo; and Akada, Masanori, 4,559,273, Cl. 428-484.000.

Yamawaki, Masami: *See*—
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Yamazaki, Hiroshi: *See*—
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Yamazaki, Hitoshi: *See*—
Murakami, Katsuo; Yamazaki, Hitoshi; Tanaka, Norihiko; and Ito, Hiroshi, 4,559,470, Cl. 313-487.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. PIN semiconductor photoelectric conversion device with two oxide layers. 4,559,552, Cl. 357-58.000.

Yanagi, Kunio: *See*—
Sakaguchi, Shozo; and Yanagi, Kunio, 4,558,798, Cl. 220-256.000.

Yasuda, Haruo: *See*—
Miyamae, Ryuichi; and Yasuda, Haruo, 4,558,707, Cl. 128-683.000.

Yellig, WilliaM F., Jr., to Standard Oil Company. Injection of steam and solvent for improved oil recovery. 4,558,740, Cl. 166-272.000.

Yester, Francis R., Jr.: *See*—
Gannon, Mark A.; and Yester, Francis R., Jr., 4,559,490, Cl. 333-202.000.

Ying, David H. S.; McDermott, Wayne T.; and Givens, Edwin N., to International Coal Refining Company. Fired heater for coal liquefaction process. 4,558,651, Cl. 110-347.000.

Yip, James K.: *See*—
Larson, Bernard J.; and Yip, James K., 4,558,720, Cl. 137-625.240.

Yip, Kwok-leung, to Xerox Corporation. Intensity control for the imaging beam of a raster scanner. 4,559,546, Cl. 346-160.000.

Yngvesson, Sven H.: *See*—
Janerstal, Tommy; and Yngvesson, Sven H., 4,558,853, Cl. 269-71.000.

Yokoyama, Akira: *See*—
Arano, Yasushi; Magata, Yasuhiro; and Yokoyama, Akira, 4,559,221, Cl. 424-1.100.

Yokoyama, Sho, to Tachikawa Spring Co., Ltd. Arm rest device of a seat for a vehicle. 4,558,901, Cl. 297-113.000.

Yorita, Tadahiro: *See*—
Nishikawa, Toshio; and Yorita, Tadahiro, 4,559,508, Cl. 333-202.000.

Yoshida, Masahiro; and Inumaru, Susumu, to Sumitomo Light Metal Industries, Ltd. Method of and apparatus for continuously or semi-continuously casting metal ingots. 4,558,730, Cl. 164-487.000.

Yoshii, Orio: *See*—
Katakabe, Noboru; Watanabe, Shuichi; Takamiya, Takehisa; Takase, Hiroaki; and Yoshii, Orio, 4,558,964, Cl. 400-144.100.

Yoshikawa, Ryoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for inspecting a circuit pattern drawn on a photomask used in manufacturing large scale integrated circuits. 4,559,603, Cl. 364-491.000.

Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing para-aminobenzoic acid-N-L-rhamnoside as an active ingredient. 4,559,327, Cl. 514-42.000.

Yoshinaga, Shinya; and Iwamura, Hiroyuki, to Hitachi, Ltd. Water heating device of heat pump type. 4,558,571, Cl. 62-238.600.

Yost, Robert B.: *See*—
Marino, John A.; Strohl, Roderick G., Jr.; and Yost, Robert B., 4,559,009, Cl. 431-184.000.

Young, Bill M.: *See*—
Borchardt, John K.; and Young, Bill M., 4,558,741, Cl. 166-275.000.

Young, Donald C., to Union Oil Company of California. Nitrogen fertilization. 4,559,076, Cl. 71-29.000.

Young, Fred D., to Boeing Company, The. Ultrasonic linear array water nozzle and method. 4,558,598, Cl. 73-644.000.

Young, William R.; and Parisoe, Leon F., to Harris Corporation. Arithmetic logic unit. 4,559,608, Cl. 364-786.000.

Yu, Keechung: *See*—
Schols, John A.; and Yu, Keechung, 4,559,375, Cl. 523-449.000.

Yu, S. Gary: *See*—
Reynolds, John G.; Yu, S. Gary; and Lewis, Robert T., 4,559,129, Cl. 208-59.000.
Reynolds, John G.; Yu, S. Gary; and Beret, Samil, 4,559,130, Cl. 208-59.000.

Yuda, Jiro: *See*—
Hori, Michimasa; Hirano, Hideo; Kojima, Yoshinori; and Yuda, Jiro, 4,558,993, Cl. 417-283.000.

Yukishima, Susumu: *See*—
Nakahama, Ryoji; Harada, Norimichi; Wada, Seiji; Hosono, Yoshio; Tomoda, Tetsuya; and Yukishima, Susumu, 4,559,018, Cl. 440-77.000.

Yusko, Edward M., Jr.: *See*—
Williams, Peter C.; Koch, Ulrich H.; Yusko, Edward M., Jr.; and Mannion, Thomas M., 4,558,874, Cl. 277-112.000.

Zagubeljuk, Vladislav F.: *See*—
Mironenko, Vyacheslav G.; Poltorak, Alexandr P.; Schutsky, Vitaly I.; Kosovtsev, Vladimir A.; Chaly, Fedor P.; Zagubeljuk, Vladislav F.; Filatov, Nikolai I.; Emelyanenko, Vadim V.; Morgunov, Valentin V.; Rozental, Eduard S.; and Litvinov, Vladimir I., 4,559,422, Cl. 200-67.00D.

Zahler, Robert, to E. R. Squibb & Sons, Inc. 3-Acylamino-1-carboxymethyloxy (or thio) carbonyl-2-azetidinones. 4,559,335, Cl. 514-210.000.

Zahnradfabrik Friedrichshafen, AG: *See*—
Fassbender, Rolf, 4,558,631, Cl. 91-516.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; and Ishizuka, Masaaki, 4,559,362, Cl. 514-674.000.

Zajic, James E.; Hill, Martha A.; Manchester, Donald F.; and Muzika, Karel, to Abitibi Paper Company Ltd. Microbial culture system. 4,559,305, Cl. 435-243.000.

Zamaloff, Victor: *See*—
Engelman, Melvin A.; Zamaloff, Victor; and Engelman, Curtis L., 4,558,841, Cl. 249-54.000.

Zauer, Karoly: *See*—
Lempert, Karoly; Doleschall, Gabor; Fetter, Jozsef; Hornyak, Gyula; Nyitrai, Jozsef; Simig, Gyula; and Zauer, Karoly, 4,559,406, Cl. 549-291.000.

Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Grohe, Klaus; Kuhle, Engelbert; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,341, Cl. 514-254.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,559,342, Cl. 514-254.000.

Zenith Electronics Corporation: *See*—
Capek, Raymond G., 4,559,506, Cl. 333-181.000.
Fendley, James R.; Kraner, James L.; and Pekosh, Raymond J., 4,559,019, Cl. 445-67.000.

Zenner, Michael M.: *See*—
Horner, Herbert F., Jr.; Zenner, Michael M.; Nowack, Daniel P.; and Christopherson, Herman P., 4,558,558, Cl. 56-11.300.

Zenuk, Charles H.: *See*—
Dromsky, John A.; and Zenuk, Charles H., 4,559,089, Cl. 148-11.50Q.

Zielenski, Albert J.: *See*—
McBrearty, Michael; Negin, Michael; Weilerstein, I. Marvin; and Zielenski, Albert J., 4,558,596, Cl. 73-588.000.

Ziemek, Gerhard, to Kabelmetal Electro Gesellschaft mit beschrankter Haftung. Heat exchanger, particularly for solar collectors and method of manufacture therefor. 4,558,736, Cl. 165-183.000.

Zimmermann, Markus: *See*—
Fuhrer, Walter; Ostermayer, Franz; and Zimmermann, Markus, 4,559,354, Cl. 514-357.000.

Zouzoulas, Gerassime: *See*—
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, 4,559,275, Cl. 428-596.000.

Zwicker, Walter K.: *See*—
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,559,280, Cl. 428-633.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Okura, Zenichi; Haneishi, Yasuyuki; and Kohmoto, Shinsuke, Re. 32,049, Cl. 354-286.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Krenzer, Eberhard, Re. 32,047, Cl. 57-246.000.

Beehive Machinery, Inc.: *See*—
McFarland, Archie R., Re. 32,050, Cl. 426-479.000.

Ceshkovsky, Ludwig; and Dakin, Wayne R., to Discovision Associates. Tracking system and method for video disc player. Re. 32,051, Cl. 369-44.000.

Dakin, Wayne R.: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., Re. 32,051, Cl. 369-44.000.

Discovision Associates: *See*—
Ceshkovsky, Ludwig; and Dakin, Wayne R., Re. 32,051, Cl. 369-44.000.

Haneishi, Yasuyuki: *See*—
Okura, Zenichi; Haneishi, Yasuyuki; and Kohmoto, Shinsuke, Re. 32,049, Cl. 354-286.000.

Kohmoto, Shinsuke: *See*—
Okura, Zenichi; Haneishi, Yasuyuki; and Kohmoto, Shinsuke, Re. 32,049, Cl. 354-286.000.

Krenzer, Eberhard, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Process for the production of a crimped continuous multifilament yarn. Re. 32,047, Cl. 57-246.000.

McFarland, Archie R., to Beehive Machinery, Inc. Process for de-boning meat or fish. Re. 32,050, Cl. 426-479.000.

Okura, Zenichi; Haneishi, Yasuyuki; and Kohmoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical contact arrangement for photographic camera with interchangeable lens. Re. 32,049, Cl. 354-286.000.

Prince Corporation: *See*—
Prince, Edgar D., Re. 32,048, Cl. 164-154.000.

Prince, Edgar D., to Prince Corporation. Tie bar adjustment system. Re. 32,048, Cl. 164-154.000.

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TO WHOM

CERTIFICATES WERE ISSUED

Abbott Laboratories: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., B1 4,420,568, Cl. 436-536.000.

Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., to Corning Glass Works. Wood burning stove. B1 4,330,503, 12-17-85, Cl. 422-177.000.

Brown, Wilbert C.; and Saba, Philip B., to TIE/Communications, Inc. Base for a telephone set. B1 8,267,873, 12-17-85, Cl. D14-60.000.

Corning Glass Works: *See*—
Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., B1 4,330,503, Cl. 422-177.000.

Coyle, Jan R.; and Stevens, Robert W. Sonic color system. B1 3,900,886, 12-17-85, Cl. 358-82.000.

Davidson, Maxwell W., to United Wire Group PLC. Heat transfer elements. B1 4,403,653, 12-17-85, Cl. 165-170.000.

Deere & Company: *See*—
Mott, Roger E., B1 3,982,383, Cl. 56-11.600.

Jolley, Michael E.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., B1 4,420,568, Cl. 436-536.000.

Kistler-Morse Corporation: *See*—
Kistler, Walter P., B1 4,064,744, Cl. 73-766.000.

Kistler, Walter P., to Kistler-Morse Corporation. Strain sensorextensiometer. B1 4,064,744, 12-17-85, Cl. 73-766.000.

Marley, John: *See*—
Parmet, Bernard S.; and Marley, John, B1 4,268,915, Cl. 455-158.000.

Motorola, Inc.: *See*—
Parmet, Bernard S.; and Marley, John, B1 4,268,915, Cl. 455-158.000.

Mott, Roger E., to Deere & Company. Harvesting platform with a floating cutter bar. B1 3,982,383, 12-17-85, Cl. 56-11.600.

Pardue, William F., Jr.: *See*—
Allaire, Roger A.; Pardue, William F., Jr.; and VanDewoestine, Robert V., B1 4,330,503, Cl. 422-177.000.

Parmet, Bernard S.; and Marley, John, to Motorola, Inc. Universal automotive electronic radio with display for tuning or time information. B1 4,268,915, 12-17-85, Cl. 455-158.000.

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Stroupe, Stephen D.: *See*—
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Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., to Abbott Laboratories. Fluorescent polarization immunoassay utilizing substituted triazinylaminofluoresceins. B1 4,420,568, 12-17-85, Cl. 436-536.000.

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Albert, Jon B., to General Motors Corporation. Alphabet font. 281,788, 12-17-85, Cl. D18-26.000.

Albert, Jon B., to General Motors Corporation. Numeral font. 281,789, 12-17-85, Cl. D18-26.000.

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Bakic, Dieter. Cosmetic case. 281,826, 12-17-85, Cl. D28-83.000.
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Lilly, Donald G. Antenna railing mount. 281,779, 12-17-85, Cl. D14-91.000.
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Haythornthwaite, Peter F., 281,810, Cl. D23-97.000.
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Tabor, James A. Sight-transposing enabling keyboard for musical instruments. 281,784, 12-17-85, Cl. D17-9.000.
Takeuchi, Akitaka; Abe, Takeshi; and Endo, Hiroshi, to Hitachi, Ltd. Facsimile transceiver. 281,780, 12-17-85, Cl. D14-94.000.
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Seager, Richard H, 281,756, Cl. D7-77.000.
Thermo-Serv, Inc.: *See*—
Trombly, Edgar F., 281,754, Cl. D7-17.000.
Trombly, Edgar F., 281,758, Cl. D7-387.000.
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Holtkamp, Reinhold, 5,601, Cl. 69.000.
Holtkamp, Reinhold, 5,602, Cl. 69.000.
Holtkamp, Reinhold, 5,603, Cl. 69.000.
Holtkamp, Reinhold, 5,604, Cl. 69.000.
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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 17, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,558,466
2.1 R 4,558,467
51 4,558,468
60 4,558,469
414 4,558,470

CLASS 4

228 4,558,471
252 R 4,558,472
420.2 4,558,473
491 4,558,474
607 4,558,475

CLASS 5

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CLASS 8

115.64 4,559,056
156 4,558,477
405 4,559,057
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CLASS 9

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1.7 4,558,479
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97 R 4,558,482
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CLASS 28

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157.3 R 4,558,499
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571 4,558,507
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145 4,559,064
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16.4 4,558,559
228 4,558,560
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CLASS 57

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17 4,559,070
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28 4,559,075
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100 4,559,083

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379 4,558,581
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40.7 4,558,587
54 4,558,588
64.1 4,558,589
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116 4,558,591
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189 4,558,594
336 4,558,595
588 4,558,596
600 4,558,597
644 4,558,598
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862.64 4,558,600
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864.21 4,558,603

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39.1 4,558,636
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CLASS 101

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226 4,558,644

CLASS 102

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527 4,558,646

CLASS 108

107 4,558,647
147 4,558,648
159 4,558,649

CLASS 109

24.1 4,558,650

CLASS 110

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CLASS 112

262.2 4,558,653
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CLASS 114

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CLASS 116

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411 4,558,658
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CLASS 119

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106 4,558,663

CLASS 123

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25 C 4,558,665
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90.44 4,558,667
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308 4,558,670
317 4,558,671
325 4,558,672
416 4,558,673
425 4,558,674
427 4,558,675
432 4,558,676
440 4,558,677
494 4,558,678
502 4,558,679
559 4,558,680
568 4,558,681
589 4,558,682
599 4,558,683
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419 PG 4,558,702
421 4,558,703
423 R 4,558,704
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719 4,558,708
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3 R 4,558,712

CLASS 134

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614.11 4,558,718
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625.24 4,558,720

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CLASS 139

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452 4,558,723

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CLASS 144

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12 E 4,559,090
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CLASS 156

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272.2 4,559,096
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352 4,559,105
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329 4,558,753
340 4,558,754

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211 4,558,756

CLASS 178

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7.1 R 4,559,416
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111 E 4,559,418

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132 4,558,759
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227 4,558,761

CLASS 181

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230 4,558,763

CLASS 182

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CLASS 188

24.19 4,558,765
79.5 B 4,558,766
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343 4,558,768

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70.18 4,558,771
106.1 4,558,773

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CLASS 194

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146 R 4,559,424
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266 4,558,791

CLASS 215

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CLASS 228

180.1 4,558,812
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CLASS 242

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54 R 4,558,830
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3.11 4,558,836
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331 4,558,845

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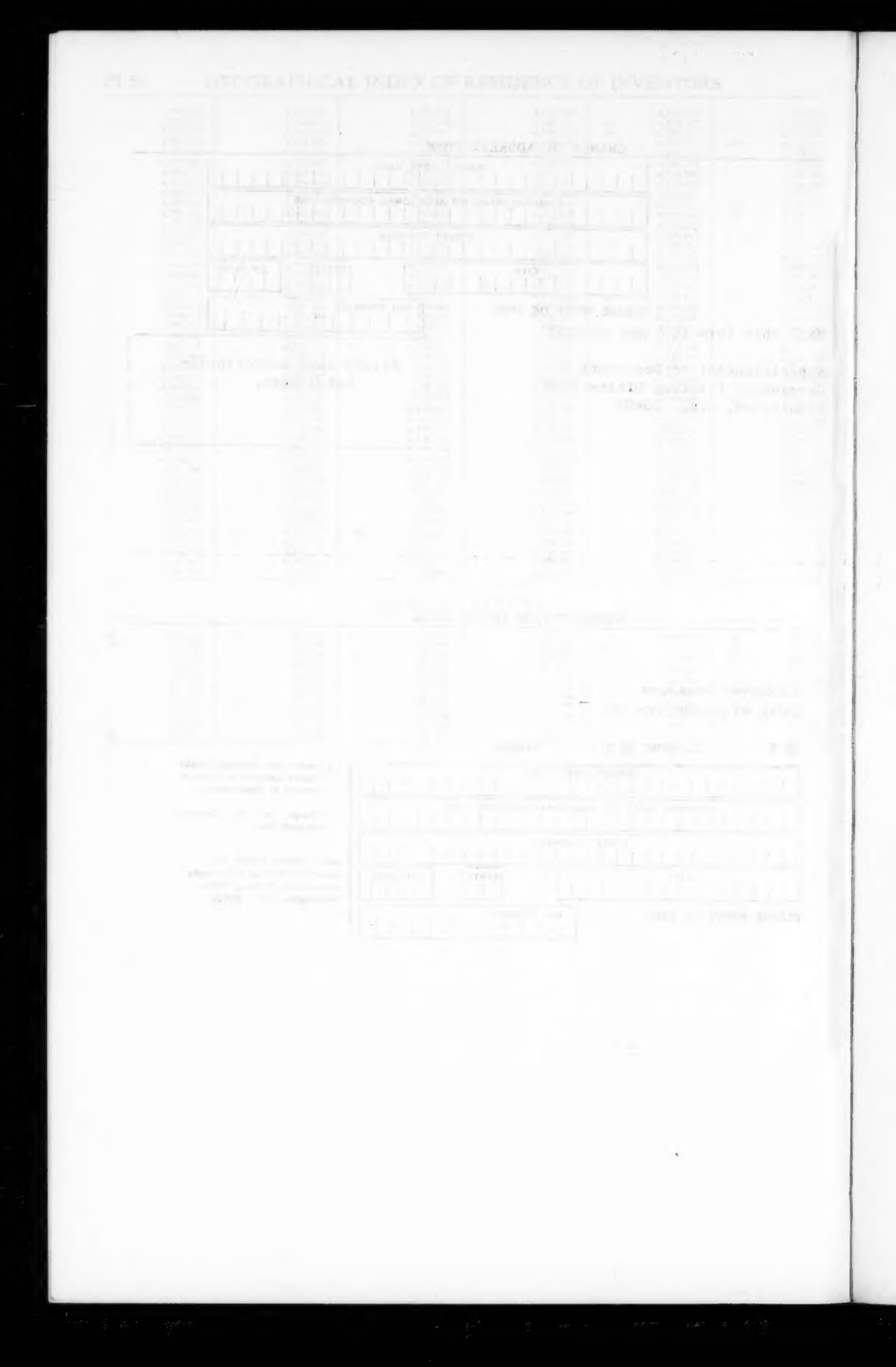

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